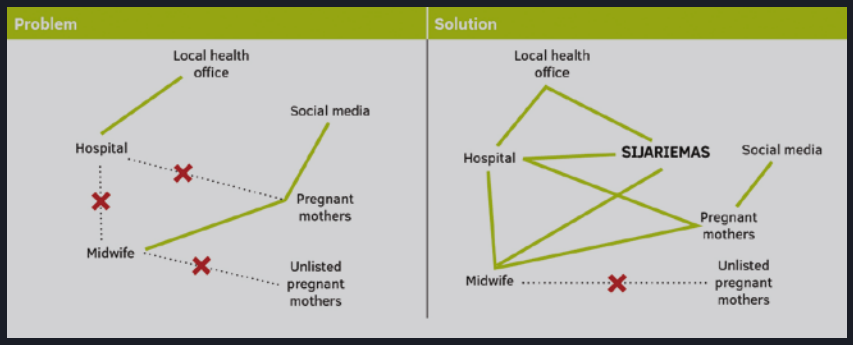
NOVEMBER 2017

MAKING ALL VOICES COUNT

RESEARCH REPORT

A GRAND CHALLENGE FOR DEVELOPMENT

Connecting citizens to their governments: lessons from ICT-based governance initiatives in Indonesia



Siti Fatimah, Markus Christian, Ari Nurfadilah, Santi Widianti and Yulita Rosa Rangkuti

big
BANDUNG INSTITUTE OF GOVERNANCE STUDIES

Authors

Siti Fatimah is the Principal Investigator for research learning on the conception and adoption of ICT-based initiatives for governance in Indonesia. She also led the Building Bridges for Better Spending project in Southeast Asia. She has experience in research, advocacy and training in various sectors, using tools such as public expenditure tracking surveys, citizen report cards, social audits, mystery shoppers and gender-responsive budgeting. Siti holds a master's degree in development studies from Bandung Institute of Technology and a bachelor's degree in international relations from Padjadjaran University.

Markus Christian is the Principal Researcher at the Bandung Institute of Governance Studies (BIGS). He holds a master's degree in development studies from Bandung Institute of Technology and has conducted research on basic services and their relation to gender and human rights. He is also interested in issues of social accountability and exploring what technology, especially ICTs, can bring to the relationship between government and citizens.

Ari Nurfadilah is a researcher at BIGS and holds a master's degree in development studies from Bandung Institute of Technology. Her focus concerns the rural economy, and she hopes that rural people can achieve greater autonomy, to become less dependent on central government and more empowered within their own economies.

Santi Widianti is a researcher at BIGS. Prior to this, she worked as a radio journalist. She has a strong interest in gender issues, and holds a master's degree in women's studies from Flinders University, Australia. She is particularly interested in women's use of ICTs, and how this can empower women.

Yulita Rosa Rangkuti holds a bachelor's degree in communications from Padjadjaran University. She worked as a radio journalist and writer prior to joining BIGS. She now manages BIGS' publications, website and social media, and ensures that BIGS' research outputs are shared widely.

Acknowledgements

This research was funded by Making All Voices Count. The researchers would like to thank the following people for their time, energy, insights and expertise.

- Nuwirman, Bambang Widjaya, Dr Trisnawati Gandawidjaja, Endang Iradati, Hadi Purwanto and Dr Asep Hidayat Lukman, Expanding Maternal and Neonatal Survival programme
- Christian Natalie and David Sutasurya, BebasSampah
- Setiaji, Jakarta Smart City
- Agung Hardjono and Okky Oktaviani, LAPOR!
- Kusnandaka Tjatur and Nuriski Imandari, Bojonegoro ICT Initiative
- Elanto Wijoyono, Sistem Informasi Desa
- Torry Kuswardono and Danny Wetangterah, Pikul
- Budi Satrio, Dodit Prasetyo, Sumanto and Cici from Gerakan Desa Membangun
- Wahyudi, LAPOR BOS
- Wawan Heru Suyatmiko, Check My School
- Ilham C. Srimarga, Sinergantara
- Naomi Hossain, Rosemary McGee, Duncan Edwards and Karen Brock, Institute of Development Studies (IDS)
- Ciana-Marie Pegus, formerly IDS
- Tim Woods, Green Ink

Reference and copyright

IDS requests due acknowledgement and quotes from this publication to be referenced as: Fatimah, S.; Christian, M.; Nurfadilah, A.; Widianti, S. and Rangkuti, Y.R. (2017) *Connecting citizens to their governments: lessons from ICT-based governance initiatives in Indonesia*, Making All Voices Count Research Report, Brighton: IDS

Contents

Executive summary

Information and communications technologies (ICTs) have become increasingly important in governance initiatives in Indonesia. This research, conducted in 2016, examines ten ICT-based governance initiatives in Indonesia that were implemented by government agencies and civil society organisations.

The study used a qualitative approach, gathering information from policy-makers, the initiators of ICT projects, people from the initiatives' target communities, and other stakeholders. This helped us to explore how these diverse innovations were conceptualised and adopted. It also enabled us to assess their impacts on citizens' experiences of governance, in terms of government responsiveness and active citizenship.

Drawing on the actor–network theory, we then developed a model to explain how innovations develop, and how the actors and technologies interact with each other and with their surrounding ecosystems. This was tested by gathering the 'stories' – their chronology, impacts, and the actors and devices involved – of the ten initiatives.

This process identified five key areas that are important to the success of ICT-based governance initiatives in Indonesia: (1) the need to understand ICT ecosystems; (2) disconnections; (3) circular patterns; (4) flexible patterns of implementation; and (5) the need to harmonise online and offline aspects.

Key themes

- ICTs for governance
- ICT ecosystems
- Public service delivery

1. Introduction

In recent years, Indonesia has seen significant growth in the number of initiatives that aim to tackle governance challenges through information and communications technologies (ICTs). Established by both the government and civil society organisations (CSOs), these have sought to increase public accountability, improve the delivery of public services, and strengthen the capacity of civil society to engage in accountability work.

Some of these have been successful, helping to strengthen public accountability and contributing to the emergence of transparent government practices and better communication between the government and civil society (Jurriens and Tapsell 2017). However, many initiatives still fail to achieve their desired impact, are unsustainable, or are used only minimally by the groups they aim to reach and involve.

Why do some ICT-based initiatives succeed while others fail? This issue is not well understood in the Indonesian context. One possibility is that during the conception phase and subsequent adoption, project staff pay insufficient attention to their 'accountability ecosystems' – defined as a system that "encompasses the diversity of formal and informal paths toward, and influences on, real accountability" (Halloran 2015: 7).

To test this premise and improve our understanding of why some ICT initiatives fail, this research compared ten ICT-based governance initiatives in Indonesia, with a focus on Open Data initiatives. We explored how successfully they interact with their ecosystems to achieve the desired changes in governance practice. To understand the reasons behind their relative success or failure, we aimed to:

- understand the patterns of implementation of ICT-based governance initiatives in Indonesia, particularly how their inherent theory of change is implemented
- examine the interactions that take place during implementation, especially for initiatives working within existing ecosystems (e.g. government institutions, particular communities)
- assess the potential impacts of ICT initiatives (e.g. improvements in government responsiveness, accountability, public service delivery) and the ecosystem factors likely to influence these, with special attention to Open Data initiatives.

This report presents the findings from this research. Section 2 sets out the key concepts for understanding ICT-based governance initiatives in Indonesia, while Section 3 describes our research methodology. Section 4 presents the main findings from the ten case studies, while Section 5 provides some comparative analysis of these, addressing the study's research questions. In Section 6, we draw our conclusions and offer some suggestions for future research on the impact of ICT-based governance initiatives.

2. ICT-based initiatives and the governance of public services

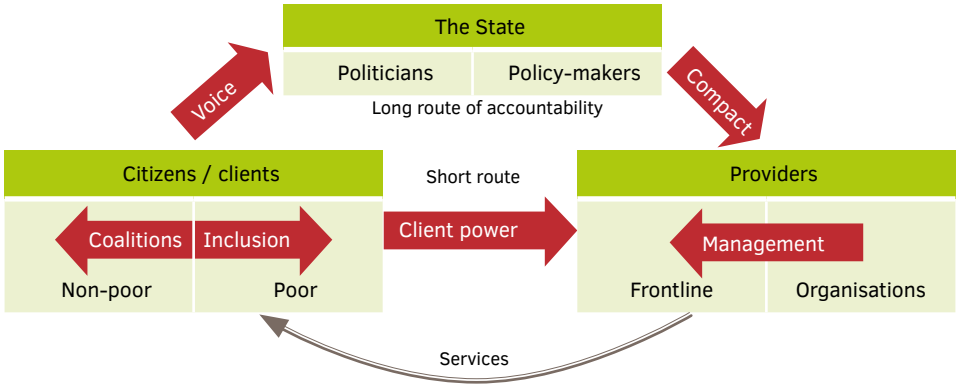
2.1 The role of ICTs in good governance

In many countries, citizen participation in decision-making for development processes has been rare and difficult to bring about (Ackerman 2004). This reflects the fact that governance processes often take place "within a given set of formal and informal rules that shape and are shaped by power" (World Bank 2017: 3). These asymmetries of power make it difficult for citizens to hold officials and public service providers to account.

An influential report (World Bank 2004) argues that accountability should be at the centre of good governance. Public services work best for citizens when the people who use them are able to demand accountability effectively. Figure 1 outlines the ways in which accountability can be achieved. This shows how accountability can be realised through the 'long route' (i.e. pressure on political authorities at the centre) or through the 'short route' (i.e. direct claims made on frontline service providers). Yet even the 'short route' to accountability may be lengthy and complex, with multiple intermediaries between citizens and service providers (Devarajan, Khemani and Walton 2013).

It is in this context – a growing recognition of the need to strengthen accountability, to improve governance and thus public services – that ICTs have been introduced in a range of settings. Many governments and civil society actors, for example, have identified, and subsequently created, ICT-based initiatives as a way to improve governance and strengthen accountability mechanisms, with the potential to

Figure 1. **Relations of accountability**



Source: Adapted from World Bank (2004)

support efforts to hold officials and service providers to account. Specifically, these initiatives are perceived as being able to:

- increase interactions between government and citizens
- empower citizens by providing information and bridging information gaps
- contribute to improvements in the delivery of public services (Harpham and Boateng 1997).

In terms of the two alternative routes to accountability, ICTs offer potentially shorter, more direct routes to accountability by connecting citizens to service providers. However, they can also be effective as tools to put greater pressure on politicians and policy-makers, by expressing demands for improved public services and opening up a space for citizens to participate in shaping public policy (Hellstrom 2008). ICTs can also improve the capacity of government bodies to be transparent and responsive, helping to tackle corruption and improve efficiency (Bertot, Jaeger and Grimes 2010; Shim and Eom 2009; Okot-Uma 2000).

While some ICT-based initiatives to improve governance have scored notable successes, evidence from across the world indicates that the overall record is mixed (World Bank 2017). This reflects both uneven access to digital platforms and the varying benefits of different ICTs – but also indicates that the systems needed to realise the potential of ICTs to empower citizens and strengthen accountability are frequently weak or absent (World Bank 2015).

2.2 ICT-based governance in Indonesia

In recent years, Indonesia has been portrayed in the national and international media as a leader in trying to put open government principles into practice. This has been driven by an increasingly connected and well-informed society, and by the government's efforts to increase its efficiency and effectiveness in order to meet its responsibilities towards its electorate (OECD 2016; Rokhman 2011).

These efforts frequently involve the use of digital or 'e-government' tools and platforms. To date, research on ICT implementation in Indonesian governance has focused on the technicalities of implementing e-government, such as developing and evaluating e-government initiatives (Hermana and Silfianti 2011; Harijadi 2004) and the display and functionality of e-government websites (Rahardjo, Mirchandani and Joshi 2007). Other studies have considered the overall status of e-government in Indonesia (Furuholt and Wahid 2008). However, from these and other studies, it is clear that the implementation and uptake of ICTs for governance has been highly uneven across Indonesia (Nurdin, Stockdale and Scheepers 2012).

E-governance refers to more than website-based services provided by central or local government agencies (Palvia and Sharma 2007). For example, Basu (2004) notes that e-governance does not merely refer to a government website as displayed on a computer screen; it also refers to the use of ICTs to connect citizens with public authorities and service providers in the processes and activities that lead to good governance. Research that takes this broader viewpoint has been rare in Indonesia, with comparatively little attention given to the broader power relations and leadership considerations involved in implementing e-governance (Furuholt and Wahid 2008; Haryono and Widiwardono 2003).

Box 1. Governance and ICTs in Indonesia: some context

In Indonesia, the recent development of ICT-based initiatives for governance is inseparable from wider changes in the country. Since the fall of President Suharto in 1998, two significant governance reforms have taken place: decentralisation, which started in 2001, and public finance reform, which started in 2003.

Decentralisation has led to several innovations in local government, such as e-budgeting and e-procurement, while public finance reforms aim to increase transparency and accountability. These include the 2008 Law on Freedom of Public Information, the establishment of the Ombudsman of the Republic of Indonesia (2008) and the Law for Public Service (2009). Following this, President Susilo Bambang Yudhoyono established the Presidential Work Unit for the Oversight and Control of Development, since renamed as the Presidential Staff Office.[1] Its main duties are monitoring and removing the bottlenecks that prevent or delay improvements to public services. Transparency has been further encouraged since 2011, when Indonesia became a founding member of the Open Government Partnership.[2]

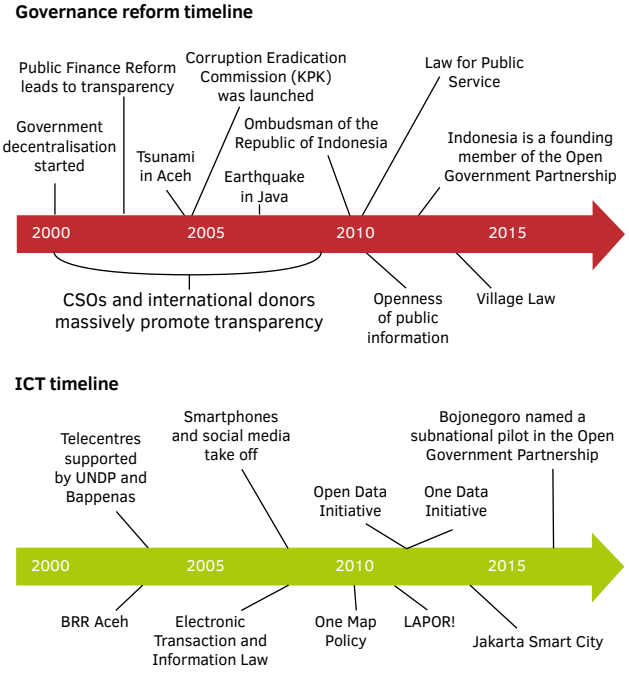
At the same time, ICTs have developed rapidly in Indonesia. Since the 2000s, there has been a boom in the use of mobile phones, which has led to significant growth in the use of SMS (short message service). Donor agencies began to implement ICT-based governance initiatives over the same period; for example, in 2004 the United Nations Development Programme (UNDP) supported the National Development Planning Board (Bappenas) to establish telecentres in many villages. And following the tsunami in 2004, which affected Aceh Province in particular, there was a massive increase in the implementation of ICTs by the Aceh Rehabilitation and Reconstruction Board (BRR Aceh).

ICTs have continued to develop in recent years, notably since 2010 when smartphones and their multiple applications were introduced. Social media has become increasingly popular, allowing citizens to connect to each other across geographic boundaries. Meanwhile, public service applications provided by the private sector, such as Go-Jek,[3] are growing rapidly and attracting many users.

The Presidential Staff Office sees this burgeoning ICT landscape as an opportunity to obtain feedback from citizens on governance issues and government performance, which is crucial to its mission of monitoring and removing bottlenecks. For example, it created LAPOR! as a pioneering national-level online complaint-handling system; at the local level, the Bojonegoro Regency[4] began to use ICTs for their complaint-handling and village development planning systems.[5]

Figure 2 maps this timeline of changes in governance against major milestones in ICT development in Indonesia.[6]

Figure 2. A timeline of governance reforms and ICT development in Indonesia



1 This is known in Indonesia as Kantor Sekretariat Presiden.
2 The Open Government Partnership is a partnership of countries brought together by the spirit of openness and public participation. When it started in 2011, it had eight founding members (Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the UK and the USA); it now has 57 members. See: www.opengovpartnership.org
3 Go-Jek is an online transportation service run by a private company. See: www.go-jek.com
4 A regency is a political subdivision of a province in Indonesia. Bojonegoro is a regency in East Java Province.
5 These are two of the case studies used in our research; see Section 4 for further information.
6 Unless stated, all figures are the authors' own creations.

2.3 ICT ecosystems, the actor–network theory and the conception–adoption model

The Open e-Policy Group's definition of ICT ecosystems explains that ICTs do not merely involve technical matter, but also include the context, or 'ecosystem', in which different stakeholders and actors use and implement ICTs: "an ICT ecosystem encompasses the policies, strategies, processes, information, technologies, applications and stakeholders that together make up a technology environment for a country, government or an enterprise" (Open e-Policy Group 2005: 3).

Building on this, Diga and May (2016) note that an ICT ecosystem approach involves socio-economic and political dynamics and spatial issues, and that there is a need to understand the context, or ecosystem, of ICT implementation. Their ecosystems approach to analysing ICT initiatives involves different actors from across the spectrum of stakeholders involved – and they put the actor at the centre of ICT ecosystems.

In Indonesia, little is known about how these actors conceive and adopt new ICT-based initiatives that aim to address governance issues. In response, this research adopted an ecosystems approach, which meant putting actors and their relations at the centre of understanding why and how ICT-based governance initiatives are conceived and adopted, and what this means for their implementation and subsequent use.

The actor–network theory offers useful approaches for this. The theory helps us to explore the questions of "why and how we have the technologies that we do" (Cressman 2009: 3). This is helpful for revealing the complexity of the socio-technical world (Ibid.), which consists of complex networks in which the social and the technical interact to generate diverse creative possibilities.

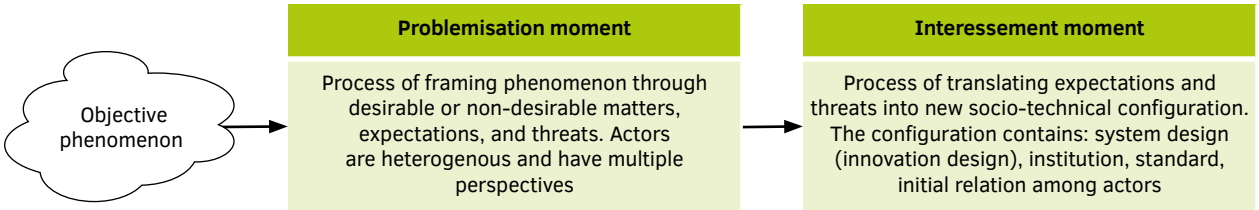
Further to this, we used Yuliar's (2009) conception–adoption model, which helps to explain how the actors and tools that interact within a network influence how innovation and development take place, building in the ecosystems in which innovation can take place. This enables the creation of an idea, followed by the development of a conceptual model, its implementation in any given environment, and ultimately the responses it receives from that environment.

The various types of decisions and processes that exist in ICT ecosystems can be grouped into two phases and four moments (see Figures 3 and 4).

- The *conception phase* comprises: (1) the *problematisation* moment, which is the process of defining a problem, and determining and agreeing on which issues will be addressed – the result of which is an idea or solution; and (2) the *interessement* moment – the translation of that idea or solution into programming that locks actors into the roles proposed for them in the solution (Callon 1986).
- The *adoption phase* includes: (1) the *engagement* or *enrolment* moment, in which initiators define and interrelate the various roles allocated to others; and (2) the *mobilisation* moment, which is determined in the interessement and engagement / enrolment phases, to realise the idea produced in problematisation phase.

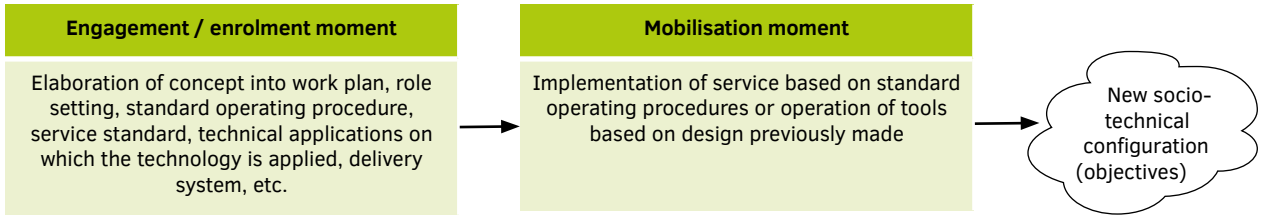
These phases may proceed in a linear fashion, as an innovation moves from an idea to its final form (i.e. the end product or service). Alternatively, certain phases may be repeated and / or loop back, for example when re-conception is followed by re-adoption (Yuliar 2009).

Figure 3. Conception phase



Source: courtesy of Ilham Cendekia Srimarga

Figure 4. Adoption phase



Source: courtesy of Ilham Cendekia Srimarga

3. Methodology

3.1 Concept and research questions

In this research, we wanted to explore ICT-based governance initiatives in Indonesia, focusing on:

- ICTs developed to improve governance
- the interactions between the initiators and implementers of ICTs, and their target communities or groups, including unexpected users
- the potential impacts for beneficiaries and citizens, whether ICT users or not.

To achieve this, we needed to analyse how the ICT initiatives operated within their ecosystems, and how they bridged the information and relational gaps between citizen-users and government agencies, as well as other actors (e.g. service providers).

The research is a proof-of-concept study, designed to isolate the factors that help to explain the success of certain ICT-based governance initiatives in Indonesia. However, although we sought to highlight the issues that influence their effectiveness and impact, we cannot comment on the nature and magnitude of these impacts on the diverse populations that the initiatives aim to serve. Instead, we determined the variables that need to be taken into account; further empirical measures of their impact are also needed.

Our results document how each initiative was designed to operate in relation to its theory of change and the ecosystem and actor networks involved, and the expected impacts and feedback. The ICT ecosystem concept (see Section 2.3) was used to explore the relationships between the ICT-based governance initiatives studied and the human and non-human entities (e.g. existing technology, enforced regulations, data, knowledge developed from project implementation) that interact with them. In this context, interaction refers to reciprocal influence; that is, not only the influence of the ICT initiative on the configuration, interests and actions of the actors involved, but also how these actors influence the form that the ICT took.

This ecosystems approach led us to use the following methods:

1. We *reviewed* existing technologies and policies, as well as the underlying social analysis used to develop the ICT initiatives' concept.
2. We *observed* how project implementers, experts and technicians understood and translated the project concept into practical guidelines for implementation (e.g. reviewing the technologies they mastered, and the technical and social knowledge that influenced their implementation strategies).
3. To assess each initiative's potential impacts, we *examined* how the beneficiaries responded, used or modified the initiative's tools. This included reviewing how they rated the efficiency of the ICT initiative, its affordability, and other factors.
4. We sought to *understand* the culture, values and interests of the beneficiaries, to assess the potential impacts on citizens in other ecosystems within Indonesia.

We identified and measured the following variables to explore these issues:

- the relationship between data supply and potential users (data demand)
- the existence and support of offline, non-ICT systems (e.g. community engagement, printed media, intermediaries)
- how gender issues and marginalised groups' concerns are addressed in relation to citizen–government engagement.

3.2 Case study methods

Data were collected using qualitative methods, including interviews and workshops with creators, users, regulators and other influential groups, and by documenting and reviewing the tools used in each of the ten case study initiatives.

These data were analysed using concepts from the ICT ecosystems theory (about the roles of actors and relations) and the actor–network theory, which pointed to the innovation moments. Both theories are socio-technical approaches to viewing how an innovation is built, implemented and adopted within a socio-technical ecosystem.

The ten ICT-based governance initiatives selected were all considered to embody good practice. Further criteria for their selection included that they: received media coverage; were cited by government officials (e.g. at conferences and seminars); and were highly regarded within the CSO community.[7]

7 For example, they are often mentioned in seminars and / or appear during online CSO network discussions about ICTs and governance. See, for example: www.ksi-indonesia.org/en/news/detail/data-innovation-for-policy-makers-conference-2014-3; and www.ksi-indonesia.org/document/material/144834968813XEBNYE.pdf

Together, these case studies comprise different examples of successful ICT-based governance initiatives, in terms of the problems they sought to address and the populations they targeted. Table 1 lists the cases studies selected.

To research and analyse these, we took the following steps.

1. *Understand the story*. We collected documents and data from each initiative (through web searches), interviewed the key actors working for the initiative, and participated in conversations and discussions about the initiative at seminars.
2. *Identify the key components*. We collected data that answered our questions developed from the actor–network theory and the technology conception–adoption framework. This included data identifying the problems the initiatives were trying to address, the solutions, the resulting transformations, the actors involved, and the relationships between these actors.
3. *Draw out the conception–adoption process*. These processes were outlined for each ICT initiative, based on interview data and mapping the actors and tools involved, and the relationships between them.
4. *Create a simplified profile*. These were developed to clarify the key elements, which then enabled comparison between them.
5. *Undertake comparative analysis*. This was done to identify the conditions under which conception–adoption processes make sufficient consideration of their ecosystems, leading to the design of interventions likely to be effective and responsive to their ecosystem conditions.

The findings from this process are illustrated in the profiles in Section 4, accompanied by a short explanation of each initiative's conception and adoption process.[8]

Table 1. Case studies

No.	Name	Indonesian translation	English translation / explanation	Website
1	EMAS	Menyelamatkan Ibu dan Bayi Baru Lahir	Expanding Maternal and Neonatal Survival	http://emasindonesia.org
	SIJARIEMAS	Sistem Informasi Jejaring Rujukan Maternal dan Neonatal	Maternal and neonatal referral exchange system	
2	BSID	Bebas Sampah Indonesia	Bandung zero-waste portal	
3	Check My School	Cek SekolahKu	Complaints system for school services	http://ceksekolahku.or.id
4	GDM	Gerakan Desa Membangun	Village development movement	http://desamembangun.id
5	LAPOR!	Layanan Aspirasi dan Pengaduan Online Rakyat	Citizens' aspirations and online complaint-handling system	https://lapor.go.id
6	Bojonegoro's LAPOR! adaptation		Integration of the LAPOR! system with traditional media and channels used by communities	
7	LAPOR BOS	LAPOR untuk Bantuan Operasional Sekolah	Online complaint-handling service for school operational costs	
8	Jakarta Smart City	Membangun Jakarta sebagai Kota Cerdas	A government portal for citizens to view data and give feedback on public services	
9	Village Information System	Sistem Informasi Desa (SID)	Citizen-based data-collection system at the village level	http://lumbungkomunitas.net
10	SMS Iklim dan Cuaca		Climate and weather information SMS	

8 More details about each case study will be available in a forthcoming report, due to be published by the end of 2017.

4. The ten ICT-based governance initiatives

4.1 EMAS

The EMAS programme aims to reduce the maternal and neonatal mortality rate in six provinces and 30 regencies in Indonesia, working with 150 hospitals and 300 sub-district health facilities. It was implemented from 2012 to 2016 by a consortium of organisations – Jhpiego, Research Triangle International, Yayasan Budi Kemuliaan and Muhammadiyah – and funded by the United States Agency for International Development.

Problem

In Indonesia, 'shopping for hospitals' is a common phenomenon: a pregnant woman may need to 'tour' hospitals to find an available space. This can be a serious challenge, especially for women with high-risk pregnancies or those from poor families. For example, pregnant women in rural areas may discover that their midwife finds it difficult to refer them to hospital, as they do not know where a space is available. This is a particularly urgent issue during emergencies, when the need for a rapid, efficient referral system can be a matter of life and death.

Proposed solution

EMAS planned the Sistem Informasi Jejaring Rujukan Maternal dan Neonatal (SIJARIEMAS) referral exchange system as an SMS gateway to address the disconnection between pregnant mothers and their hospitals or health centres. This allows midwives to act as intermediaries, for example sharing delivery schedules and updates on the condition of women about to give birth, and providing women with information about which hospitals could attend to them. The assumption was that by using the system, pregnant women would know where to go, and the hospital would be ready to provide the necessary medical assistance.

Figure 5 illustrates how SIJARIEMAS was designed to correct, in particular, the disconnections between pregnant women and midwives, and between midwives and hospitals.

Adoption

The SIJARIEMAS SMS gateway was built to establish a direct channel between hospitals and midwives. Social media was initially included in the system as a platform for citizens, including pregnant women, to monitor and report on the quality of the referral system. The social media platform was abandoned, however, because it was considered unnecessary by the target group (health workers and officials) and not the answer to their needs; they simply needed a better referral information system.

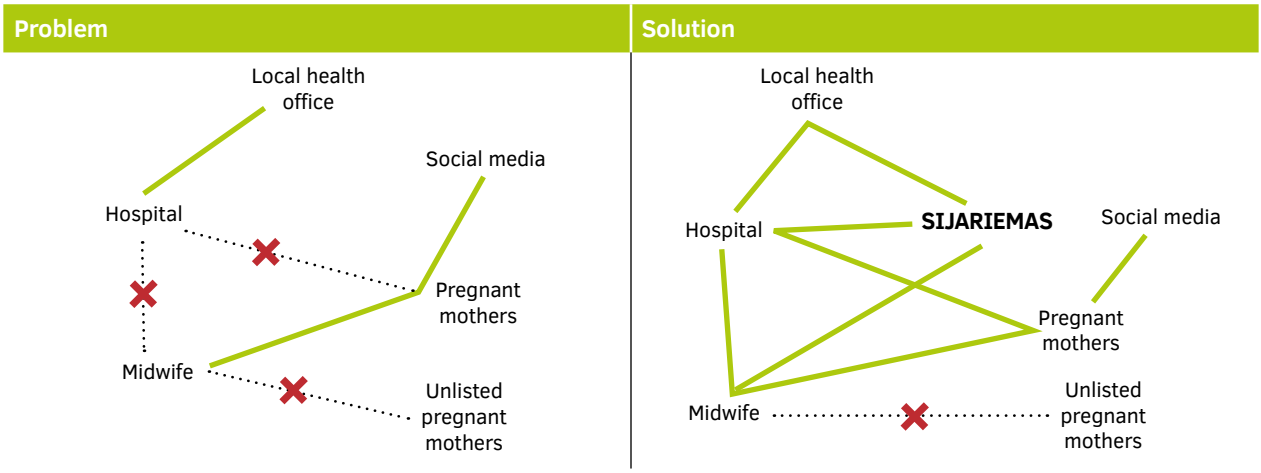
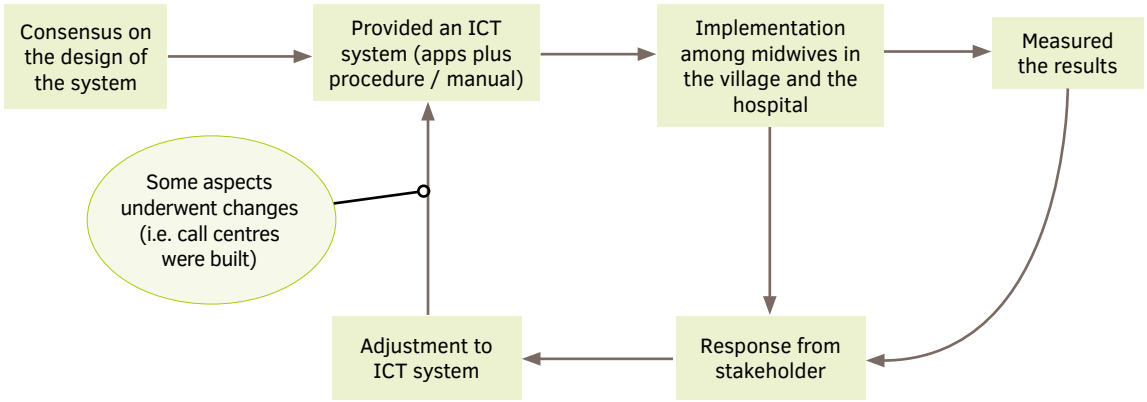


Figure 5. How SIJARIEMAS aimed to address the problem[9]

9 In the illustrations of the ten ICT-based initiatives, a green line represents a direct relationship, while a red ✕ represents a disconnection.

Figure 6. Conception and adoption process for EMAS



Source: Interviews with EMAS team at central office and West Java office, and with an implementer in Karawang Regency

The SMS gateway has partially closed the disconnection between pregnant women and hospitals, but only for pregnant women who visit midwives; unlisted pregnant women are still excluded. The system has not been able to overcome all disconnections completely.

EMAS also engages in offline activities, such as cooperation agreements for referral management, improving emergency systems in health facilities, and training midwives and hospital staff in emergency care and clinical governance. The level of adoption of these varies among regions, but the introduction of SIJARIEMAS has been an important innovation for most of the regions conducting the programme.

4.2 BSID

BSID is a waste-management information portal in Bandung City (West Java Province). Operating since 2015, it is run by staff from three CSOs: Greeneration, Perkumpulan Yayasan Pengembangan Biosains dan Bioteknologi, and Ikatan Alumni Teknik Lingkungan Institut Teknologi Bandung.

Problem

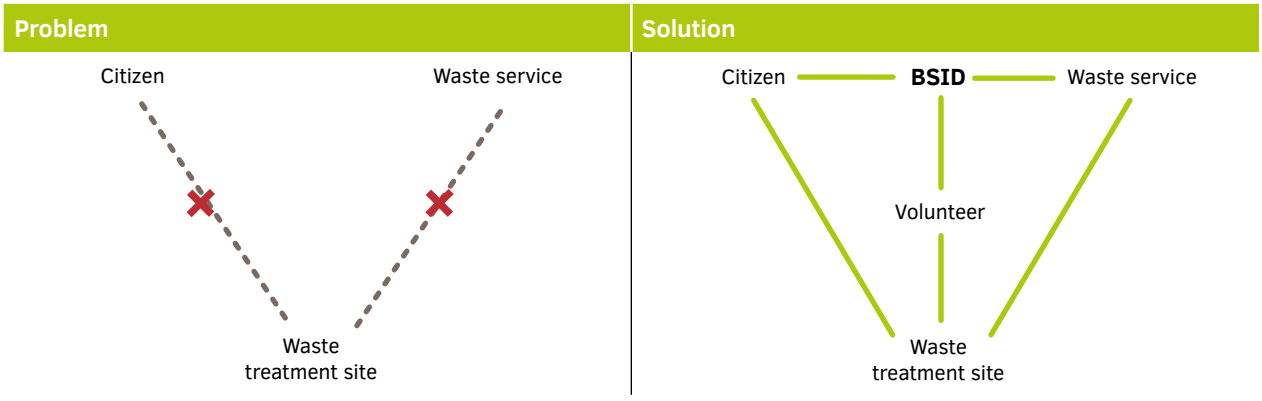
Waste management in Bandung City operates via an old-fashioned model: stack, haul and throw away, with most waste ending up in treatment or landfill sites. People discard waste without thinking about the need to reduce, reuse and recycle, and are uninformed about waste and waste management generally. Bandung had no real-time waste information system before the project.

Proposed solution

The aim of the BSID project was to develop a portal of information about 'positive waste assets': facilities that prevent waste from ending up in landfill (e.g. bio-digesters and waste treatment sites). Access to this information would provide a dashboard to help the government's urban sanitation service to manage the city's waste, and help citizens to find places to take their waste. The information was intended to come via citizens sending data by SMS or a digital map-based application.

Figure 7 shows how BSID was designed to overcome the problem of the lack of timely information about the volume of solid waste at waste treatment sites, for both citizens and the urban sanitation service.

Figure 7. How BSID aimed to address the problem



Adoption

The project's initiators built the BSID portal to contain information and digital maps based on information supplied by volunteers about waste treatment sites and the condition of waste dumps. The project set out along a linear progression from conception to adoption (see Section 2.3), without needing to return to the conception phase. However, a circular approach was ultimately required (Figure 8).

The BSID design relied on volunteers sending information to its portal, and the project developers expected there to be citizen buy-in. However, during the initial adoption phase, it soon became clear that only citizens with high prior awareness of waste management issues were using the platform and, as such, its impact was limited. The project developers realised that more awareness-raising and campaigning would be needed to increase the number of volunteers sending data by SMS.

This feedback prompted the initiators to adjust the initial concept by enlisting volunteers to raise awareness among citizens of good waste management in general, as well as the existence of the BSID platform. Nonetheless, BSID's current contribution to waste management in Bandung, for both the urban sanitation service and the public, remains limited.

4.3 Check My School

Check My School is a system for collecting communities' complaints on school services. This programme, which began in 2014, is led by Transparency International Indonesia in cooperation with the Affiliated Network for Social Accountability in East Asia and the Pacific–Philippines, the General Inspectorate of the Indonesian Ministry of Education and Culture, and Hivos. The programme operates in Semarang City (Central Java Province), Makassar City (South Sulawesi Province), Palangkaraya City (Central Kalimantan Province) and Batang Regency (Central Java Province).

Problem

Check My School is closely related to the Ministry of Education and Culture's School Operational Cost programme (known locally as Bantuan Operasional Sekolah, or BOS), through which 20% of the state budget is allocated to education. BOS funds are transferred directly to schools, and schools are not allowed to charge tuition fees. However, some schools still charged students an additional tuition fee, even after the government had provided funds for students via the BOS programme. This is one of many issues that Check My School aimed to address.

Proposed solution

School committees tended to limit their discussions to issues around teaching and learning, and did not adequately represent the concerns of students and parents, or involve them in school planning. The project initiator saw community participation in school monitoring as a way to better represent these groups and address issues such as financial malpractice by school authorities. By encouraging schools to open up their budgeting and work planning to these groups, the project initiator hoped to close the accountability gap between schools and parents (Figure 9).

Adoption

Check My School aimed to make it easier for parents to make complaints directly to schools through a portal, and involve parents in school budgeting and work planning through each school's offline bulletin board and website. It also aimed to encourage schools to involve students and parents more in policy-making.

Figure 8. Conception and adoption process for BSID

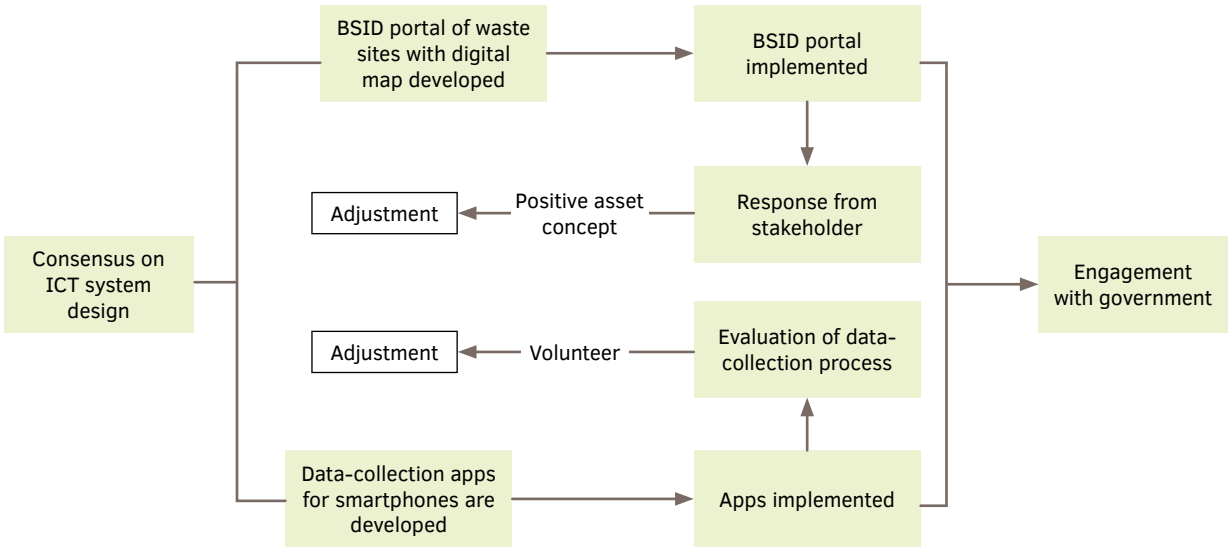
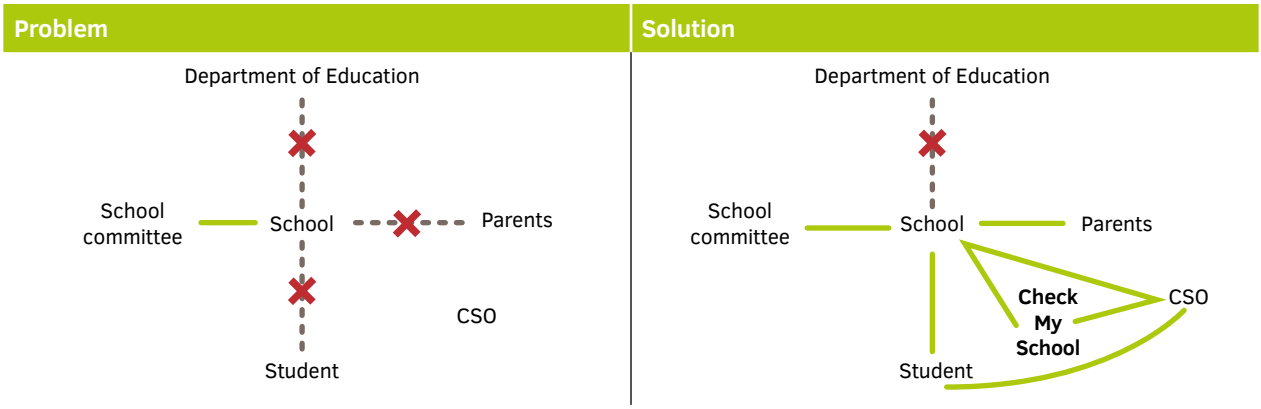


Figure 9. How Check My School aimed to address the problem



For example, students were trained by CSOs to become 'school agents', responsible for receiving and passing on complaints to a school's authorities and agreeing on solutions.

The portal was made available on an android-based application in Google PlayStore, and via a phone number for text messages. This approach meant that CSOs could be involved by reporting online complaints about a school's facilities or infrastructure, or its financial and / or academic activities. In theory, school authorities would then follow up on these complaints and resolve them; the resolution would also be communicated through the portal. As the complaints were publicly available, local CSOs and the complainants could monitor the process of receiving and resolving complaints. CSOs were also expected to chase up schools which did not resolve complaints.

The project implementers expected three common types of complaint: about school infrastructure, about finances and about academic activities. Statistics for January to November 2016 reveal that infrastructure received the highest percentage of complaints (66%), followed by academic (24%) and then finance (10%) (Check My School nd). The project has had notable success in strengthening connections between schools, communities and students.

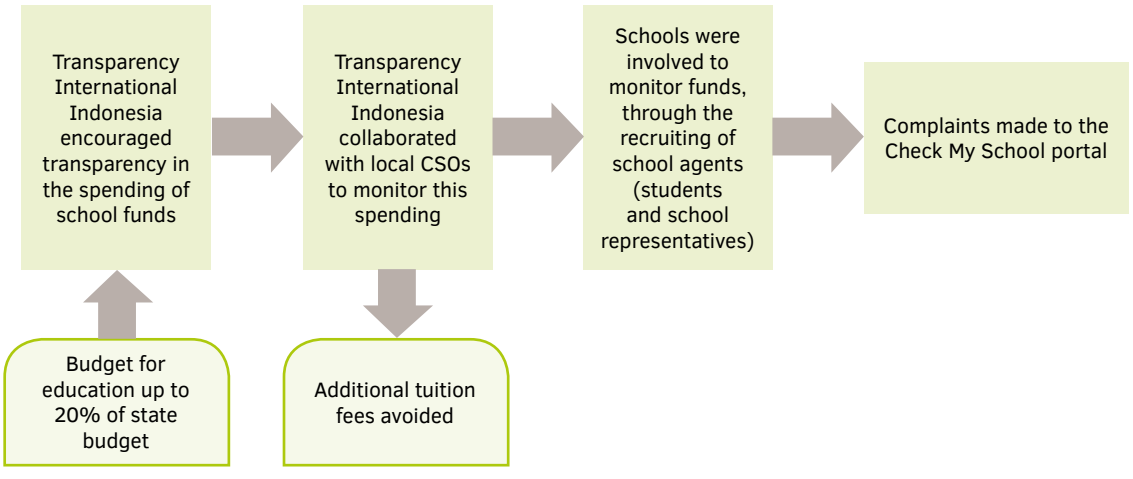
4.4 GDM

GDM aims to improve village self-reliance through information technology, particularly use of the Internet. Based in Banyumas Regency, Central Java Province, the initiative was created in 2011 by the Gedhe community. It has since spread throughout Indonesia.

Problem

Farmers, livestock breeders and craftspeople lack direct access to broader markets for their products, and have poor connections with village governments, which limits their wider livelihood options. The Gedhe community saw that many villagers were struggling to achieve economic self-reliance.

Figure 10. Conception and adoption process for Check My School



Proposed solution

With the aim of improving the welfare of Banyumas and helping it to gain economic independence from the urban and central governments, the Gedhe community sought to create change through increasing citizens' use of the Internet. This included developing village websites and using them to market community products, as well as providing training in citizen journalism.

These activities were expected to improve the livelihoods of farmers, breeders and craftspeople, by connecting them to markets and boosting their sales. Developing village websites would also strengthen connections between village governance structures and producers, as website managers would be part of the village government, and would need to build better connections with farmers.

Adoption

To address the two main disconnections – between villagers and their governments, and between producers and markets – the Gedhe community developed a website for villages in Banyumas. Figure 12 shows the conception and adoption process.

GDM was pioneered in Melung, a poor, remote village on Slamet Mountain in Central Java, along with seven neighbouring villages. They published information about daily village life on the website. For example, villagers started to upload information about their livestock, harvests and handicrafts, and even shared their financial and work plans. The project also helped to strengthen offline interactions between village governance structures and producers, such as the monthly community meetings.

These pioneers encouraged other villages to follow and, in 2014, the Gedhe Foundation was officially founded to extend and manage the movement. To date, GDM has 263 village members throughout Indonesia.

These processes demonstrate a circular approach. The initiator made an initial plan, evaluated it and then planned further activities based on what he had learned. This laid the ground for sustainability and opened up a broader space for other actors to become involved.

Figure 11. How GDM aimed to address the problem

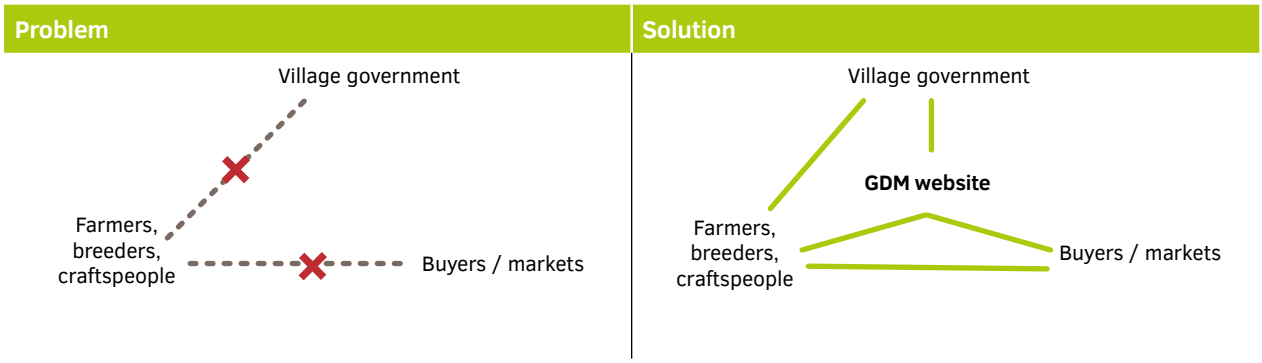
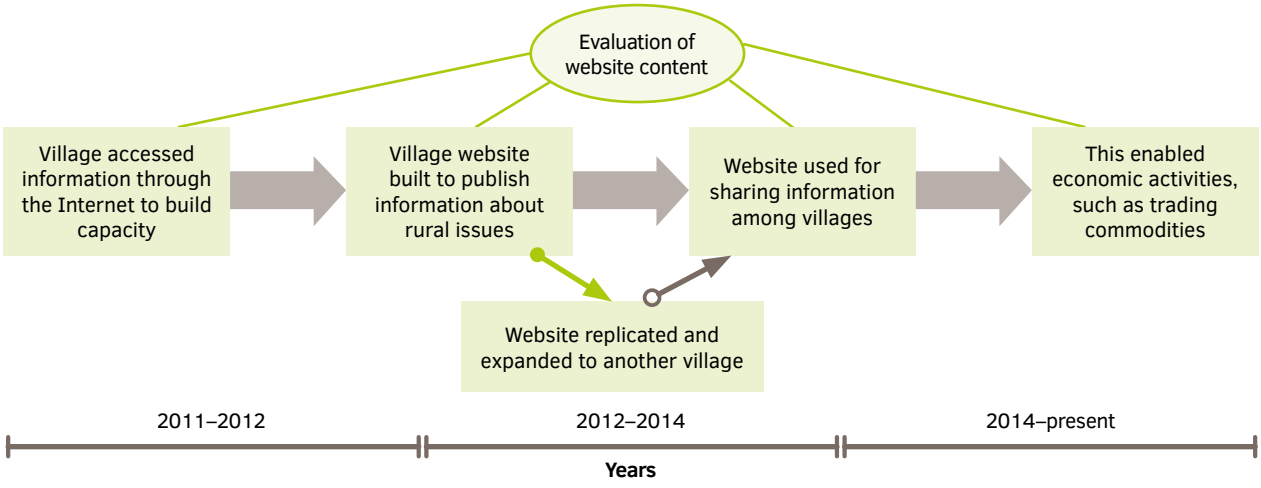


Figure 12. Conception and adoption process for GDM



Source: Interviews with staff of the Gedhe Foundation; village websites

While GDM did not set a target for its impact on each village's economy or product marketing during the conception phase, its replication in further villages indicates success. One reason behind this is that it is more affordable, and reaches more readers, than newspapers.[10]

4.5 LAPOR!

LAPOR! enables community reports and complaints about public service delivery. Launched in 2012, it was developed by the Presidential Unit for Development Monitoring and Control (UKP4) and is now managed by the Presidential Staff Office. It has been used by 80 government ministries and institutions, several state-owned enterprises and 19 local governments.

According to the Presidential Staff Office, it has 390,000 registered users and receives up to 500 reports daily. These users are citizens, who actively monitor the implementation of the public services administered and run by government departments and agencies, as well as by subnational governments. Reports to LAPOR! usually increase significantly in the wake of controversial policies with broad impacts, such as gas price hikes; at these times, daily reports can exceed 10,000.

Problem

The Presidential Staff Office needed to monitor the delivery of public services to citizens, and to hear popular opinion – both complaints and requests – in relation to controversial policies or issues. Yet the Presidency's only means of monitoring and capturing citizen complaints was official reports processed by government bureaucracy.

Proposed solution

LAPOR! aimed to address the disconnection between the Presidential Staff Office and citizens through various channels and applications, including new systems such as an SMS gateway and existing channels such as social media (e.g. Twitter). Citizens' reports would be managed by the LAPOR! team, then delivered to the relevant agencies. The responses of the agencies involved – in which they would first acknowledge the complaint or report, then resolve the problem – would be monitored under the LAPOR! system, so that it would be easy for anyone to check whether a complainant has received a response, and whether the matter has been resolved.

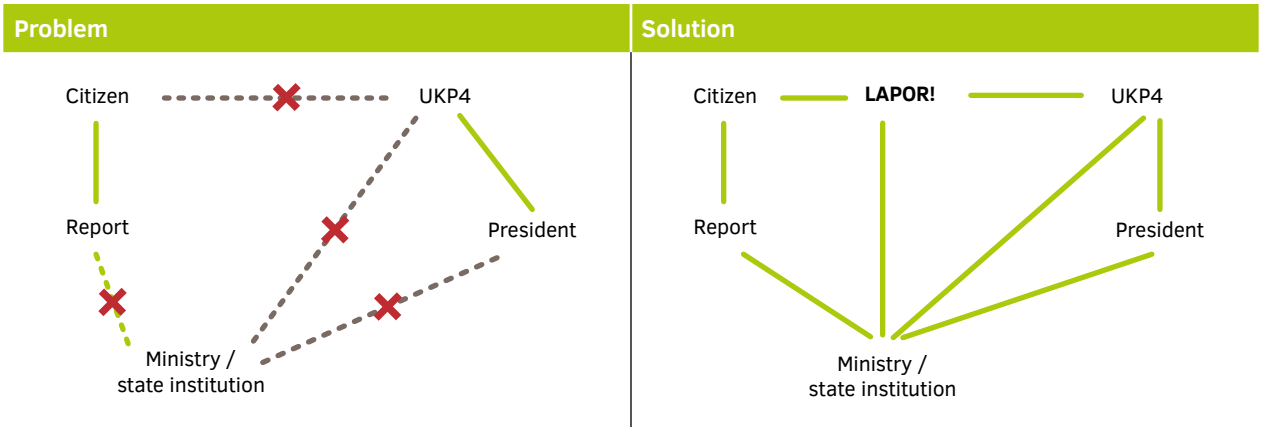
The programme initiators also observed the disconnection between the Presidency and the government ministries and agencies, and sought to improve this. For example, through LAPOR!, the Presidential Staff Office could monitor the performance of ministries and state institutions, including their responsiveness to complaints.

Adoption

LAPOR! was designed to bridge these many gaps in accountability. The platform integrates several communication channels that are used to submit complaints. Citizens, including the users of public services, post their complaints and requests through these channels. Administrators then sort through these and distribute them to the relevant local government agencies. Once created, LAPOR! was adopted by various government agencies, including those in local government. In 2016, it was in the process of being adopted as the main application for a national complaint-handling mechanism for public services.

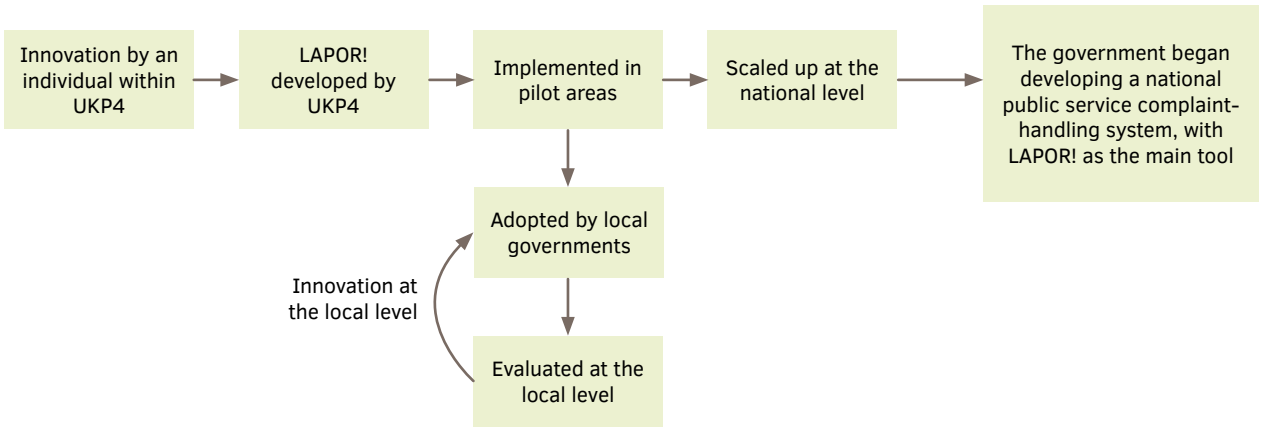
LAPOR!'s conception and adoption process highlights the lack of harmony between online and offline systems, however. Citizens' reports are recorded online and sent to relevant agencies, but they are not accompanied by offline systems and mechanisms to ensure a response or follow-up by relevant agencies.

Figure 13. How LAPOR! aimed to address the problem



10 Interview with a GDM pioneer, 17 May 2016.

Figure 14. Conception and adoption process for LAPOR!



Such offline systems only apply to priority programmes, through which the Presidential Staff Office can summon the relevant agency to clarify its concerns. However, the Office does not have any power of enforcement.

4.6 Bojonegoro's LAPOR! adaptation

Bojonegoro Regency in East Java Province was once one of the poorest regencies in this province, but developed rapidly after the discovery of oil and gas. In 2008, this growth drove the authorities in Bojonegoro Regency to adopt an open approach to government and undertake innovations to increase accountability in governance; many strategies involved the use of ICTs. This case study captures two ICT innovations in Bojonegoro: its adaptation of the LAPOR! system (see Section 4.5), and its use of village-level data in participatory village-level planning.

Problem

The problems of underdevelopment, limited government capacity, and abundant but underused technology were the starting points. For example, Bojonegoro Regency had been chosen as a subnational government pilot programme in the Open Government Partnership. This meant that it received lots of technological aid, but this was not being used to promote development or build government capacity.

At the village level, the village governments did not have their own data (i.e. collected by the village itself), and the available village-level data was not regularly updated. This caused problems in development planning processes, as village governments were disconnected from their citizens, and citizens lacked information, for example about the state of village infrastructure.

Proposed solution

Bojonegoro Regency had implemented the national LAPOR! system, but it was not integrated with other governance mechanisms. In response, it decided to adapt and enhance LAPOR! by developing applications to connect it with the traditional channels and media used by communities, including offline approaches such as the public 'Friday dialogue' with the Regency[11] and the use of SMS.

In addition, the Regency had been unable to monitor LAPOR!'s performance effectively. The proposed adjustments would enable the Regency to evaluate complaint managers weekly, to monitor complaints received, and check progress in resolving these.

Adoption

In the early stages of adoption, the disconnections persisted. Community complaints uploaded to the system received little attention from the local government; the authorities still tended to use conventional systems, such as phone calls, SMS messages sent to the Regency's LAPOR! SMS centre, and the Friday dialogues. In response, the Bojonegoro government implemented further adaptations. They developed further applications and procedures to connect traditional media and communications channels to LAPOR!, and they started holding weekly evaluation meetings with the Regent to monitor progress in handling complaints.

The adaptations made to the LAPOR! platform mean that complaints can now be made via a wider range of media in Bojonegoro (see Figure 16). For example, the Friday dialogue is broadcast on local radio. Complaints and inputs from citizens are recorded at every meeting and put into the system, and any

11 The 'Friday dialogue' is a public dialogue space in which community members can express their complaints and wishes directly to the government. It is held by the Bojonegoro government every Friday, and is widely credited with improving public services in the Regency.

Figure 15. How Bojonegoro's LAPOR! adaptation aimed to address the problem

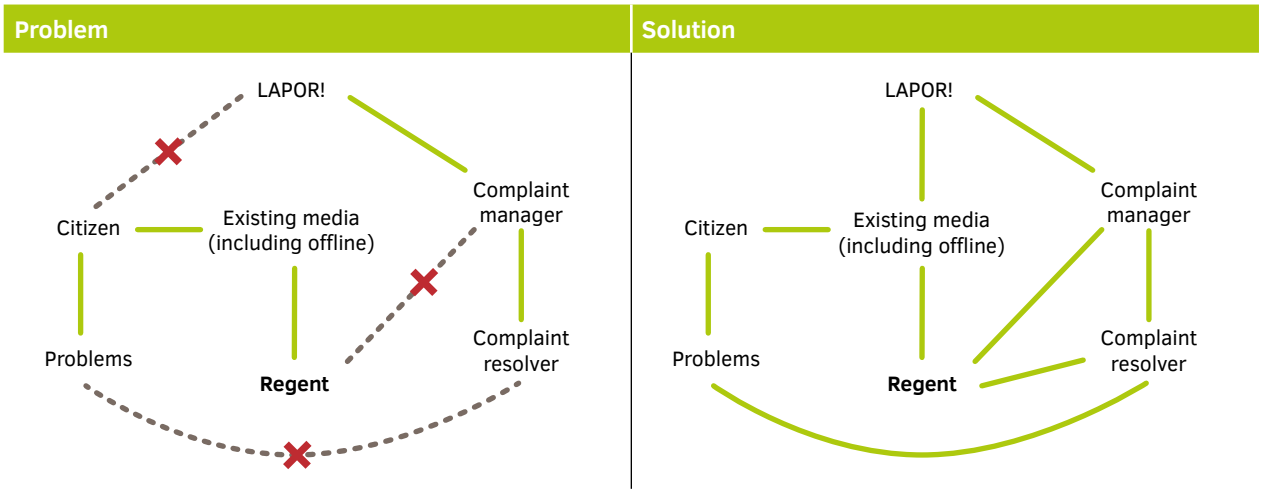
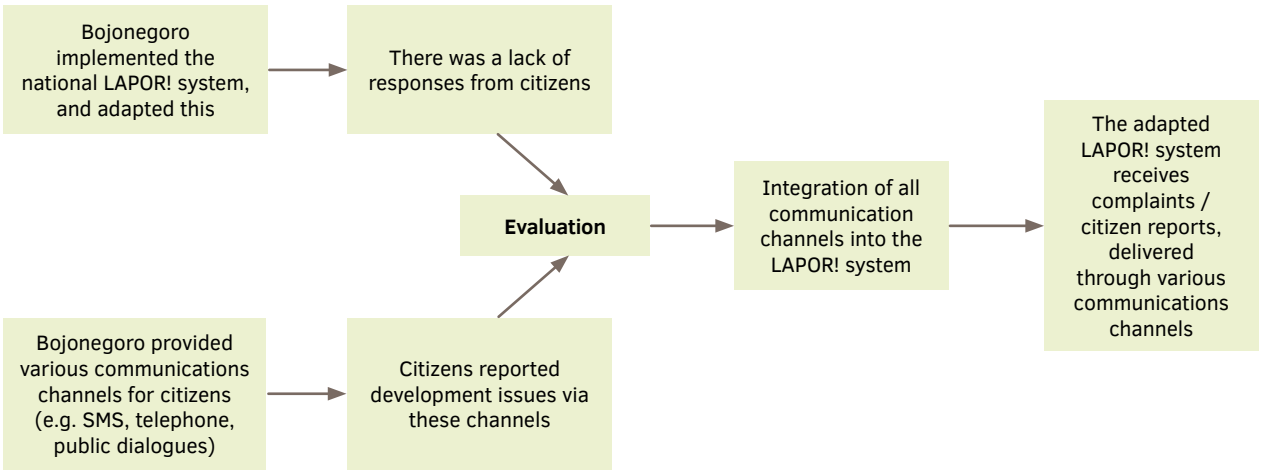


Figure 16. The conception and adoption process in the Bojonegoro ICT initiative



follow-up on these can be monitored by citizens. The Bojonegoro Regent, Suyoto, also monitors the follow-up through internal meetings with local government agencies every week.

4.7 LAPOR BOS

LAPOR BOS was developed in 2014 by the Ministry of Education and Culture to give schools and communities a mechanism for making complaints about problems with implementation of the School Operational Aid programme (known locally as Bantuan Operasional Sekolah, or BOS). Problems included delays in the transferral of funds and the misuse of funds. Around 5,000 complaints were entered during 2014–2016, mostly from schools asking about the disbursement status of funds.

Problem

When it was launched in 2005, the School Operational Aid programme was not accompanied by any regulation or monitoring mechanisms, or any way for communities to register complaints. Without any regulations about how to monitor and evaluate the programme, the existing complaint-handling unit in the Ministry was unable to pass complaints to its management team. This made it difficult for the programme's management to monitor its implementation, and schools and communities were unable to report problems to the Ministry or the programme's managers.

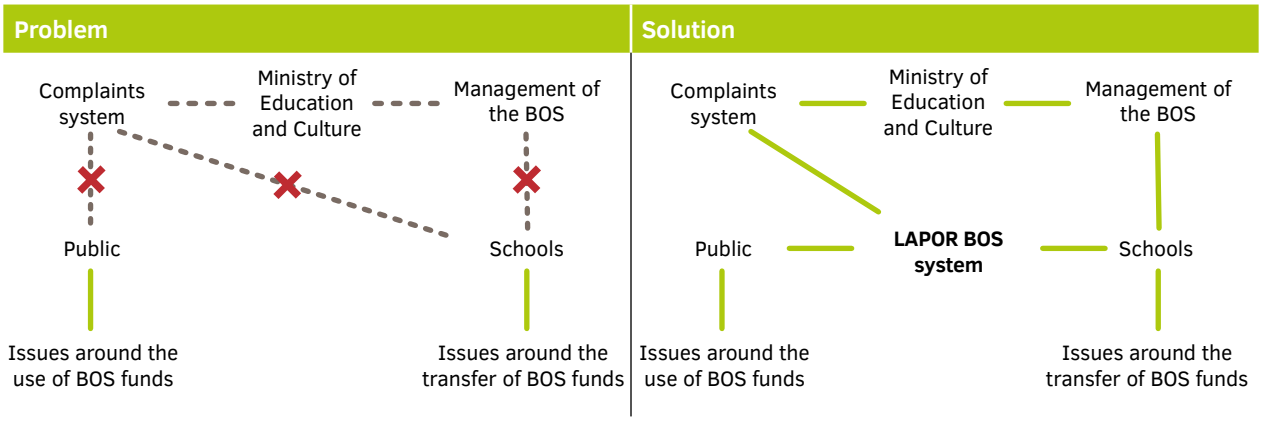
Proposed solution

The Ministry of Education and Culture planned a system in which complaints, issues and criticisms could be made via its official website, or by SMS. This would address the disconnection between communities and schools on one side, and the programme's management team and the Ministry on the other.

Adoption

LAPOR BOS's initiator developed a portal that could be accessed by the public, including school communities. Data, especially reports from the community, act

Figure 17. How LAPOR BOS addresses the problem



as the basis. This is collated in the portal so that the School Operational Aid programme can follow up on complaints and improve the programme's performance. Complaints on the misuse of funds are followed up offline, for example by investigating the school in question.[12] Complaints about the disbursement of funds are followed up to improve the process; this data also helps to strengthen the local government's database about education assets.

The project was approached in a linear manner, from conception to adoption, with little scope for feedback or further innovation. However, the project has since been reconceptualised, incorporating feedback into the design of the initiative and thus adapting it to better fit the ecosystem within which it is embedded. The project's sustainability is also supported by the fact that it was initiated by a government ministry, which has the power to enforce it.

4.8 Jakarta Smart City

The Jakarta Smart City portal was launched at the end of 2014 by Jakarta's provincial government, to open up government data to the public for transparency purposes. It includes citizen-complaint software and a government response-monitoring application.

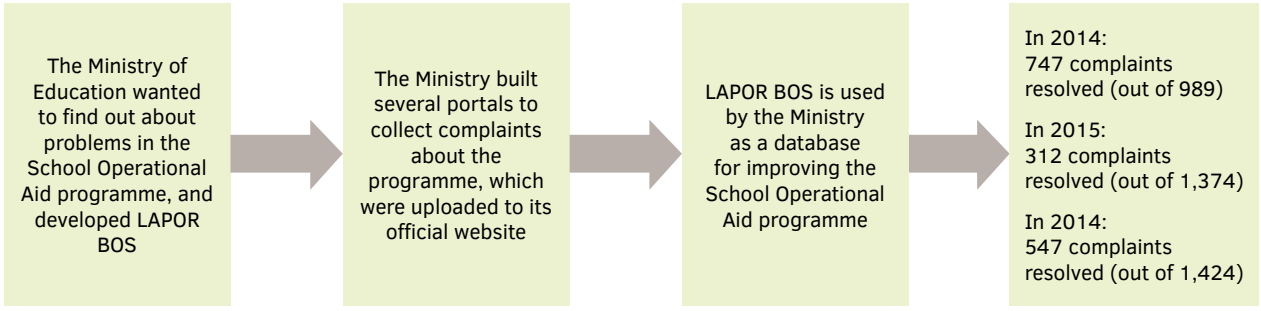
Problem

The initiative arose from a perceived disconnection between citizens' needs and government responsiveness, and the governor of Jakarta's need to monitor service provision by the Jakarta provincial government. It is difficult for any city governor to be aware of all the problems facing citizens, and a governor's control over governance structures is limited by the considerable government bureaucracy that exists in Indonesia. However, citizens often have many legitimate complaints, and lack effective channels to raise them.

Proposed solution

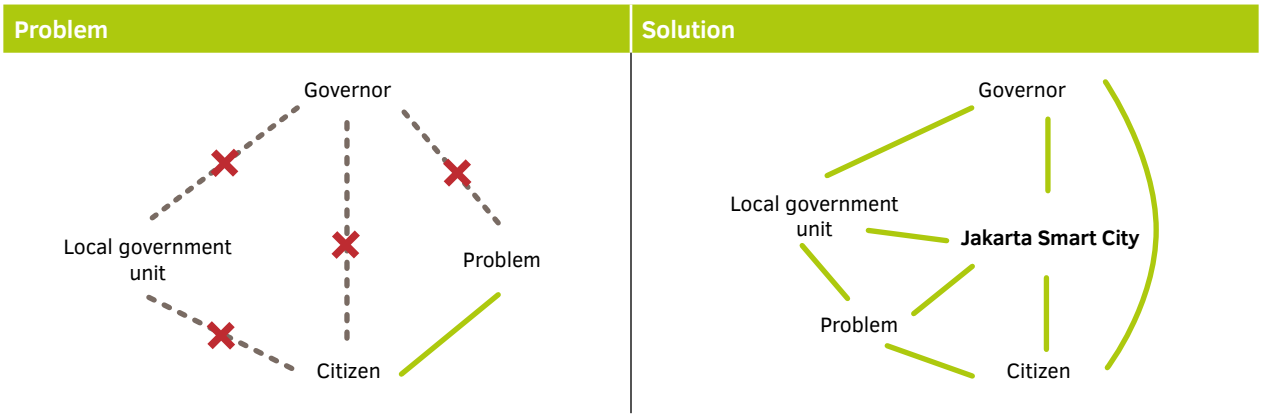
The Jakarta provincial government developed the portal to act as a bridge between citizens and government agencies. Its proposed supporting applications included Qlue, through which citizens can file complaints, and CROP (Cepat Respons Opini Publik), which monitors responses to these complaints. Citizens would use these (and other) applications to report problems related to traffic, waste management and flooding, among others, and the portal would forward reports to government agencies and the city governor. To increase accountability and ensure that agencies respond, the applications would allow the governor to monitor their responses.

Figure 18. Conception and adoption process for LAPOR BOS



12 Interview with Wahyudi, School Operational Aid programme manager for middle schools, 17 June 2016.

Figure 19. How Jakarta Smart City aimed to address the problem



Adoption

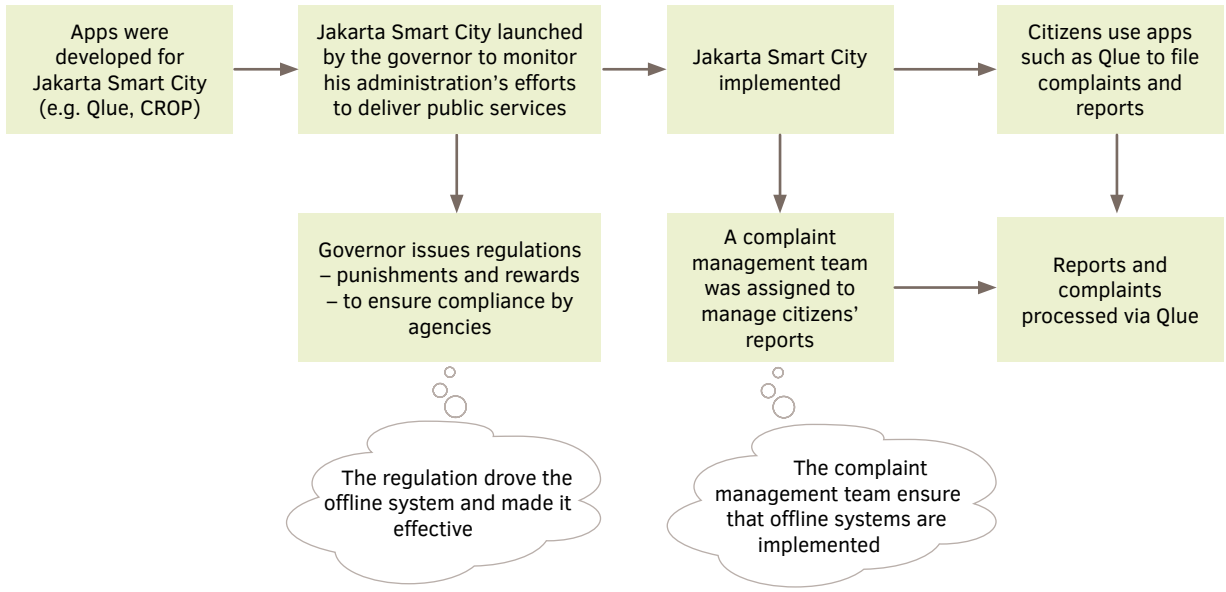
Based on these issues, the initiator developed Jakarta Smart City to enable the governor to visualise and understand the problems being reported by citizens more easily, and improve how existing governance structures processed and resolved complaints.

The initiative was adopted quickly. Its applications are widely used, with Qlue having around 100,000 users and an estimated 2,000 reports per day (Putri, Maharani Karlina and Tanaya 2016); other sources claim that 200,000 citizens use Qlue and 5,000 reports are filed daily (Dachlan 2016). The number of reports being resolved varies daily, and can be monitored via a map.[13]

Qlue also receives media attention, as it is used to assess the performance of, and public satisfaction with, the city governor. Government units that do not respond quickly and adequately receive a firm sanction from the governor. There were complaints about declining response rates in late 2016, however (*Jakarta Post* 2016).

The conception and adoption process demonstrates the importance of an ICT programme initiator understanding the surrounding ecosystem. The governor of Jakarta had the power to push city government service units and bureaucratic staff to implement his policies. However, the governor had a limited capacity for monitoring the work of each unit. Jakarta Smart City addresses this specific weakness, giving the governor greater oversight over the bureaucracy and making it possible to identify which areas must improve in providing public services.

Figure 20. Conception and adoption process for Jakarta Smart City



13 See: http://smartcity.jakarta.go.id/maps

4.9 The Village Information System

The Village Information System is a programme pioneered by the Combine Resource Institution in a series of villages in the Special Region of Yogyakarta, Java. The programme aims to strengthen village-level governance by improving the citizen-based data-collection system at the village level.

Problem

Before this programme, villages found it difficult to undertake their own development planning, as they lacked accurate and up-to-date data (e.g. on demographics and resources). This issue was brought to light during earthquake recovery efforts in 2006, which revealed that villages rarely collected and recorded local data, even though this is supposed to be updated annually and reported to the local or central government. Further, the village data that *was* recorded was usually stored as hard copies (e.g. printed reports).

Proposed solution

The Village Information System emerged in recognition of the need to store, process and use village data electronically for village development planning purposes. It was proposed as a web-based application, which is better suited to the quick retrieval of information (Jahja, Haryana and Rendra 2012).

The programme introduced a village-level data-collection system to enable village governments to collect, manage and access village data more easily. Village data is usually collected to meet data requests from the central and local governments, including statistical agencies (e.g. upper village governments). The proposal assumed that citizens would participate in village development planning.

Adoption

The Village Information System was tested in Terong Village, in Bantul Regency of Yogyakarta, and in Balerante Village, in Klaten Regency of Central Java Province in 2009, during post-earthquake disaster recovery efforts. Since then, it has extended to 145 villages in Java. In 2013, it expanded beyond Java to West Nusa Tenggara, East Nusa Tenggara and Southeast Sulawesi.

It was developed as a participatory data-collection system. After intensive discussions (e.g. regarding the demographic data needed), work teams in villages collect the data. This has had a positive impact, not only in improving data availability, but also in strengthening citizen participation in village development planning.

The application is installed in a village office computer, and can function as the village's website (if that village is connected to the Internet). While it was initially built to respond to disasters – specifically to collect data about damage to assets – some of those implementing it saw an opportunity for a wider range of uses, including

Figure 21. How the Village Information System aimed to address the problem

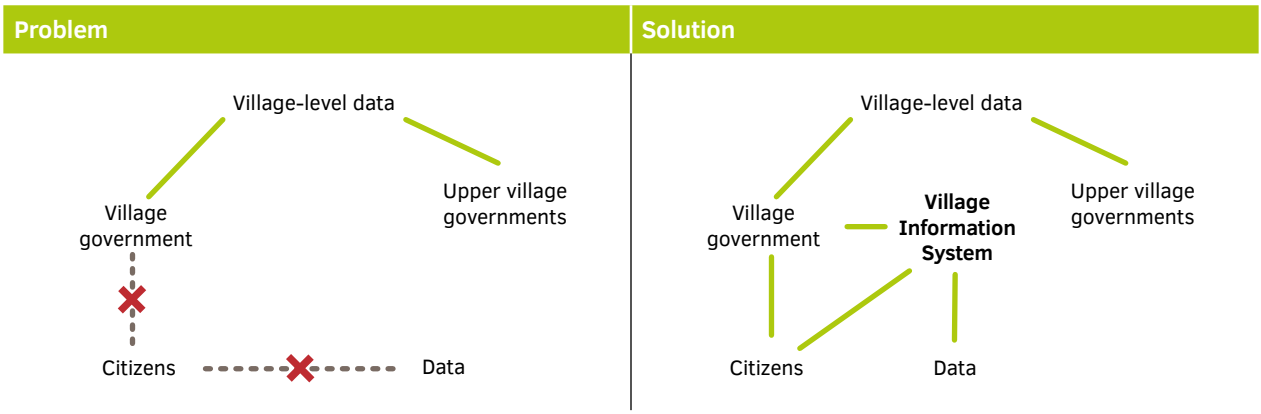
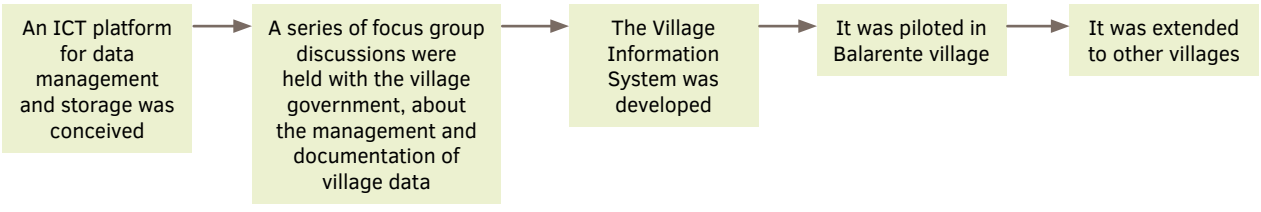


Figure 22. Conception and adoption process for the Village Information System



village development planning. Villages' data needs vary, and the application was developed to be adaptable to the specific needs of each village. As a result, it has been used to help alleviate poverty, develop tourism, ensure disaster preparedness and improve inclusivity, among others.

While the system can support village development and various local agendas, its effectiveness depends on the commitment of village heads to development planning and use of the information collected.

4.10 SMS Iklim dan Cuaca

SMS Iklim dan Cuaca is an SMS gateway programme that provides climate and weather information. It was created by Pikul, a CSO that works in Kupang City and Kupang Regency, and targets farming and fishing communities.

Problem

People in East Nusa Tenggara mostly rely on farming and fishing for their livelihoods. As these are greatly affected by the climate and weather conditions, they need access to reliable information about these. The Government of Indonesia provides this information through the Meteorology, Climatology and Geophysical Agency and other relevant ministries, but often this does not reach farming and fishing communities, or the information is too technical for them to understand.

Proposed solution

Pikul designed the initiative to bridge this information gap and connect farming and fishing communities to government-provided climate and weather information – via SMS. This would enhance their local knowledge, helping them to protect their livelihoods and keep safe.

Adoption

Pikul developed an online relationship with the Meteorology, Climatology and Geophysical Agency to access climate and weather information. This is processed manually and simplified in order to make it understandable, and then forwarded to farming and fishing communities via the SMS gateway. This approach builds on the offline relationship between Pikul and farming and fishing communities, established through cooperation in previous programmes, and creates an online connection between communities and the Meteorology, Climatology and Geophysical Agency.

From July to November 2014, there were 1,083 direct community recipients in Kupang City and Kupang Regency. Furthermore, 32 village governments and 100 local government agencies, non-governmental organisations (NGOs) and scholars received the information via SMS. The initiative has addressed the lack of climate and weather information among farmers and fishers, which has helped these marginalised people, who often have few assets.

Figure 23. How SMS Iklim dan Cuaca aimed to address the problem

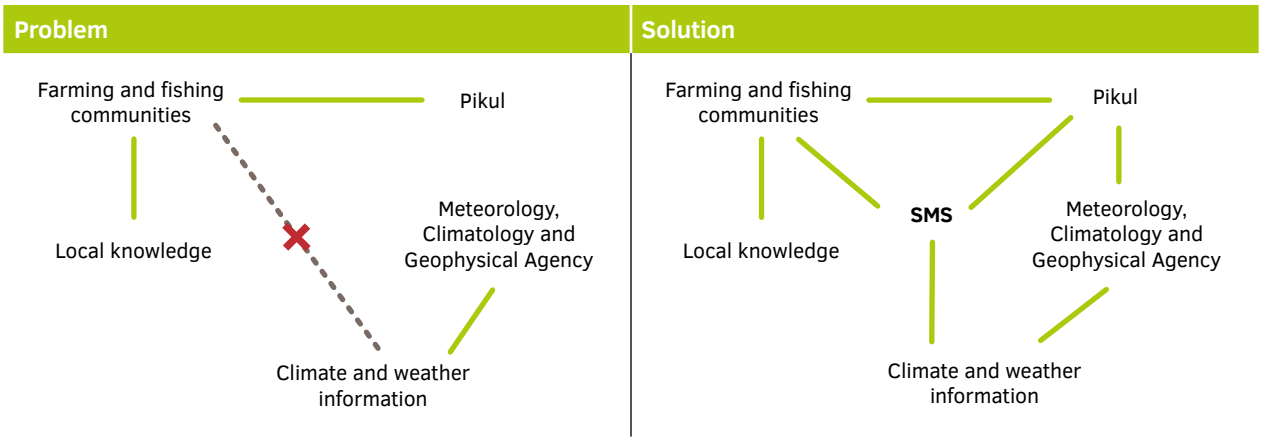
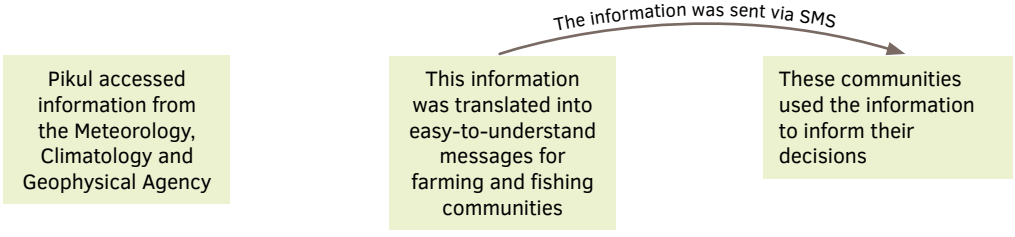


Figure 24. Conception and adoption process for SMS Iklin dan Cuaca



5. Lessons from the ten case studies

While each initiative studied was successful, no robust empirical evidence of their impacts exists. Such an evaluation of these initiatives, which operate across diverse socio-economic and political contexts, was beyond the scope of this research. Instead, we aimed to understand better how and why these initiatives were conceived and adopted in the ways that they were, and to assess the potential of these initiatives as models that can be rolled out or scaled up in other settings in Indonesia.

5.1 Theories of change in ICT-based governance initiatives

Each of the ICT-based governance initiatives was designed with the following theory of change: that it is possible to improve peoples' lives and livelihoods by connecting citizens and government more effectively, improving communication about governance and public services, and building the institutions and practices of community participation in governance.

In each initiative, the overall aim was to address disconnections between citizens and government, in terms of information and communication, participation in governance processes, and / or official responsiveness to community needs.

- Some initiatives were designed to 'close the gap' between citizens and the state, by giving citizens better, more direct access to state-provided services, information and resources: the red route.
- Some initiatives were designed to make government more responsive to citizens: the green route.
- Some initiatives were designed to stimulate citizen participation, which in turn leads to citizen action (online or offline) that encourages improvements in government responsiveness: the black route.

Figure 25 summarises the three broad processes through which these initiatives were designed to contribute to this change.

Some of the initiatives made significant efforts to understand the ICT ecosystem within which they were situated, and to design ICT-based interventions in light of this knowledge. Others were more tactical, trying to close the disconnection through both online and offline approaches.

In each case, the extent to which the specific theory of change proved correct was determined by the interactions between:

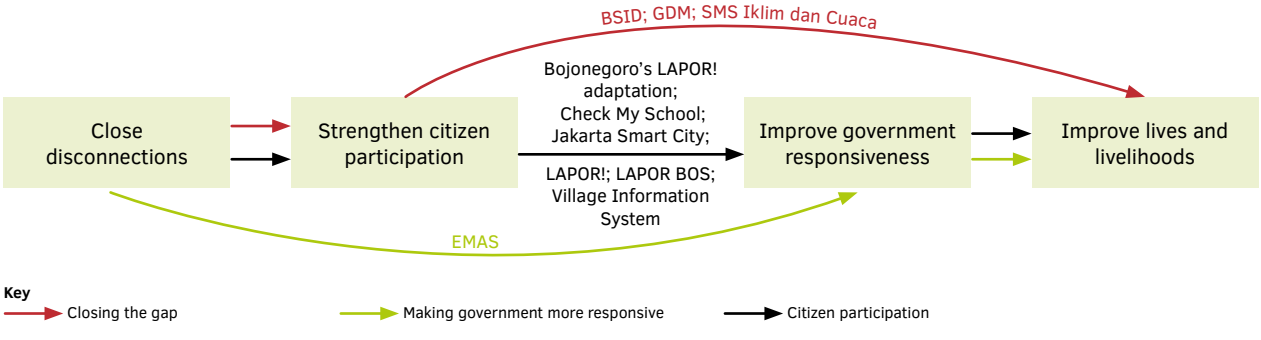
- the combination of actors (e.g. ICT initiators, project implementers) that constituted the ICT ecosystem of the initiative
- the technology options available
- the governance arrangements within which the initiative was implemented, including how, and the extent to which, accountability relations were likely to be strengthened through the initiative.

During the conception and adoption phases, each project's initiators and implementers had to deal with these three factors. In doing so, they had to make decisions and create strategies that would ensure their initiatives would be successful. The case studies revealed how these decisions and strategies were made and created, and how each initiative adjusted.

GDM, for example, used an 'open actor' strategy, designed to engage with a flexible but unorganised configuration of government and citizen actors. The project initiators wanted to give these actors more room in which to demonstrate their potential and contribute to the project. As an example, it enabled youth actors who understand ICTs to share these abilities with farmers and village government officials. The decision to use this strategy was related to GDM's open design process.

GDM also wanted to bring village issues being communicated offline into its online domain. Many villages have strong offline connections through a culture of people working together and helping each

Figure 25. Impact routes



other out. Through the project, this strength was brought into online communication. Having an open actor configuration and online features meant that GDM could initiate a process of continuous improvement among those involved. This circular pattern can be observed in its many re-conception and re-adoption processes, which helped the platform better meet the needs of all the actors involved.

Bojonegoro Regency's adaptation of the LAPOR! system took place in response to the challenge of how best to use the various kinds of technology available in the area. Once it became known that the Regency would be implementing open government practices, many offers to provide ICT solutions were made. But while the availability of technology was not an issue for the actors involved, they faced the challenge of a limited number of people in Bojonegoro having the necessary technical skills to use these. The project therefore needed to develop the required human capacity.

In dealing with this limitation, the initiators, particularly the Regent, became interested in how to utilise technology to support development. The Regent's two main interests were how to implement technological innovations so that they directly support open government, and how to ensure technology transfer so that the bureaucracy improved its technical capacity. Their strategy for technology transfer was to create and repeat diverse projects, and to provide staff with opportunities for learning – a circular process of adoption and feedback.

Another factor that the ICT-based initiatives needed to consider was the governance system within which they operated. For example, those involved with the Jakarta Smart City initiative had experienced the changes to the governance system that occurred when the Freedom of Public Information Law and the Public Service Law were introduced. These laws act as the basis for governments to open up and improve public services, and their existence led indirectly to a demand for innovation.

This created a space for the city governor to adopt proposals for ICT innovations. The governor already felt that governance in Jakarta was ineffective, and considered ICTs to be of the utmost urgency. The governor then took on a flexible role, to be able to control the system's implementation as it progressed from an idea into daily practice in the city's governance systems.

5.2 The influence of ICT ecosystems on government responsiveness and accountability

In this section, we draw out lessons about the influence of ICT ecosystems in the ten case studies. To do this, we examined their standard operating procedures and working mechanisms, as well as the supporting sub-systems (e.g. capacity-building).

As discussed in Section 2.3, 'ecosystems' in this context refers to the actors, particularly government and citizens, surrounding the ICT system who influence its conception and adoption; the availability of technological options; and the governance system, particularly existing policies, into which it is introduced. Our analysis focused on the interactions between these ecosystems, the ICT initiatives developed in the ten case studies, and their conception and adoption processes.

Governments

Most of the ICT initiatives were implemented by national or subnational governments eager to develop good governance practices. As a result, the responses from government were generally positive. Projects in which local governments or ministries were aiming to improve public services and / or their communication with communities were fully capitalised on by the ICT initiators and implementers.

In some initiatives that originated from CSOs, however, governments were not involved until the design phase, by which time the technology had been selected; in others, government bodies took on an enabling role only.

Citizens

Target users are important actors in an ICT ecosystem. A common feature of these ten initiatives was that the citizens and other target users:

- fully accepted the ICT-based initiative and became users of its applications
- negotiated or requested modifications to the system (either to the ICT application or the offline mechanisms)
- submitted their own designs to challenge the results produced by the ICT initiative.

The pace of technology development

Available technology is another element of an ICT ecosystem. The conception and adoption processes for the ten initiatives studied took place during a period of rapid ICT development in Indonesia (2000–2015). In some cases, the technology selected in the conception phase had become obsolete by the adoption phase. In these situations, the technology originally selected was sometimes modified (and sometimes not), but in each case the overall design of the system (e.g. its goals, the service beneficiaries expected to receive) remained the same.

Based on our observations, we identified the following elements of ICT ecosystems as influencing the ten initiatives.

- *Circular approaches and flexible planning*. The initiators and implementers of some of the ICT initiatives reviewed the system they had developed. They then began to reconceptualise or redesign it in response to other ecosystem actors – for example, because the target users had requested modifications – or because the technology involved had developed very quickly. The re-conception and redesign processes were regarded as a necessity, rather than a constraint. The result was a circular conception–adoption approach, which does not see the system as complete once it is implemented and used by users; instead, it seeks to open the system up to learning and feedback, which are used to improve it.
- *Promote more open, participatory strategies*. This increases the involvement of a wider sector of actors. It is influenced by governments' desires, as well as citizens' desires to participate in determining the governance systems being developed for them. By creating this space, project initiators sought to ensure that their systems were broadly supported by both governments and citizens.
- *Promote governments' desire to take on responsibility*. Governments need ICT-based initiatives to address a variety of disconnection issues; many initiators therefore expect governments to take on and use the systems they have built.

5.3 Key areas of learning about how ICT-based governance initiatives work

Understanding ecosystems

ICT-based governance initiatives are likely to yield more positive impacts if those who design and implement them understand, and pay attention to, the needs and characteristics of their ICT ecosystems. This understanding is achieved when an initiator is open to the participation of all those ecosystem actors involved – both humans and tools.

Understanding ecosystems means understanding the interactions among the human beings, systems and technologies in the surrounding environment, and how those interactions address each actor's needs. By understanding the ecosystem, an initiator will better understand existing problems, particularly how technology can play a part in providing potential solutions. ICT-based solutions should only be introduced if those implementing them are equipped with an adequate understanding of existing problems.

A good example of how to understand the ICT ecosystem is Jakarta Smart City. The project initiators observed the problems that led to their initiative. Through this, they understood that public service delivery in Jakarta is highly complex and the city governor was not able to keep track of everything that what was happening, what every public service unit was doing, or how to control the state apparatus and its service providers. The initiative's founders were also able to identify the right technology to use, which enabled the governor to grasp the complexity of these problems more comprehensively.

Understanding disconnection

The depth of an initiator's understanding of disconnections – information gaps between two or more actors – is likely to influence the ICT-based initiative's ability to solve the problems it is targeting. The initiatives studied were implemented to address disconnections on both the supply side (i.e. government) and demand side (i.e. citizens) of public service provisions. They sought to make government information more accessible, and make it easier for citizens to provide feedback.

Understanding circular approaches

Like many projects, ICT-based initiatives are often implemented using a linear approach, flowing from planning to implementation to evaluation. Not all ten initiatives studied here used this approach, however. Some used a circular approach. Rather than ending once the project was evaluated, the actors found new problems during the evaluation phase, which motivated them to continue. This led to refinements or new applications, which were then added to the projects. And when these actors discover further challenges in the future, they will once again refine, develop and implement these. We observed that the initiatives that used circular patterns were more likely to be sustainable, as they were more open to the increasing involvement of, and feedback from, other actors.

This cyclical pattern can be found in the ICT initiative developed by the Bojonegoro Regency. Despite already having the Friday dialogue in place, the Regency adapted the existing LAPOR! platform, and another complaint-handling channel that used SMS, radio and Twitter, to strengthen its dialogue with citizens. This circular approach successfully sustained the development and implementation of the original ICT initiative (LAPOR!); it has also opened up space for the involvement of other actors, as new participants now attend the dialogues.

By contrast, Check My School followed a linear pattern. It started with the planning phase, initiated by Transparency International Indonesia, then the implementation phase (carried out together with local CSOs and schools), and finally the evaluation phase, carried out solely by Transparency International Indonesia again. But after the programme ended, no new initiative was developed to take its place.

The link between online and offline

ICT-based governance initiatives have a greater impact when the actors who build and implement them understand the importance of harmonising online and offline elements. In all ICT initiatives, the online element is at the centre. However, in some of our case studies, offline actions played a crucial role in their success.

EMAS is an example of this. Through the online SIJARIEMAS system, midwives supporting women in emergency situations or facing high-risk births could report the women's condition to the referral hospital. This meant that when the woman arrived, the hospital was ready to receive her with the necessary equipment and health personnel in place. In an area with many hospitals, there might be a call centre that receives the online reports from midwives and forwards the emergency information to all hospitals in the area. But this system relied on an offline support system – for example the offline cooperation agreements between hospitals and midwives and the training provided (e.g. for maternal emergencies).

The need for flexibility

The implementation of most ICT initiatives is guided by strict procedures (e.g. standard operating procedures). By contrast, some of the initiatives we researched were implemented with more flexibility. The initiators tended to be involved throughout each project's implementation, in order to understand exactly why a certain phase might fail. As a result, improvements were made to the technology's design during each phase, which is likely to have enhanced them.

The Village Information System is an example of a flexible ICT initiative. Lumbung Komunitas, a unit of the Combine Resource Institution, held discussions with village governments to gain an understanding of each village's needs. Lumbung Komunitas also assessed and studied each village's management and regulation. The village governments then formed village teams that worked on local development planning using the Village Information System application, with the data adjusted to each village's identified needs. This brought flexibility into play, as each village could use and develop the data creatively, according to its own needs. As noted, some villages used the application for poverty alleviation, while others used it to develop tourism or to mitigate disaster risks, among other uses. The villages thus moved from being implementers of the technology into initiators.

Flexibility in project roles is also an advantage. A pattern that allows people to shift from being an initiator in an ICT initiative to another position (e.g. an implementer) may create opportunities for success. As the person changes their position, they can identify and understand problems due to their experience in earlier phases, and thus respond more effectively.

6. Conclusions and recommendations

The ten ICT-based governance initiatives analysed were selected based on their reputations for success and effectiveness. They all achieved real change in the relationships between citizens and governments, including improved access to public services, improved government responsiveness and greater community participation. Our research identified several key approaches that are likely to have enabled this success – factors that are embedded in the initiatives' conception and adoption, and that are responsive to the local ICT ecosystem.

Many of these factors support our research hypothesis: that an ICT initiative is likely to deliver its desired change if its implementation builds on, and works with, the surrounding ICT ecosystem.

The interaction between an ICT initiative and its surrounding ecosystem first occurs when the concept is being developed – the conception phase – and continues through to implementation – the adoption phase. During the conception phase, interaction between the initiative and its ecosystem is largely influenced by its initiator, who can, for example, open – or close – opportunities for the participation of outside actors in the formulation of the initial concept.

It was evident from our research that involving outside actors helps to ensure that the end product – the ICT initiative – has a greater connection to its ecosystem, and is therefore more likely to achieve impact. It allows the initiator to gain a deeper understanding of the problems the initiative needs to address (e.g. a disconnection between citizens and government).

In summary:

- *A participatory process contributes to the overall effectiveness of an ICT initiative*. Participatory processes occur when: (1) the initiative opens up space for participation by other actors; (2) there is a flexible development approach that allows for actions beyond the project's initial scope; and (3) the conception and adoption processes are circular rather than linear.
- *A strong understanding of the ICT ecosystem, by the initiator and implementer, is central to success*. Having this understanding makes it easier for these

actors to identify the multiple disconnections that can occur (e.g. between government and citizens, between service providers and users, between information sources and communities). Often, these disconnections cannot be identified until the project is underway, so this understanding develops during the project.

- *The wider ICT ecosystem, such as the policy environment, needs to be open and flexible*. Government policies that create space for ICT initiators and implementers can support new initiatives and help them to be successful. For example, targeted policies can create the opportunities that project initiators need to identify the disconnections that occur among target groups, and to improve and adapt the selected technology to make the project more effective.

6.1 Recommendations

As noted, this is a proof-of-concept study; we did not aim to test and demonstrate the impact of the case study initiatives in terms of addressing disconnections in public service delivery. However, it is fair to say that the ten initiatives do all allow policy-makers – in central government, government ministries and state institutions, and at the province, regency, city and village levels – to strengthen their public service programmes. It is also fair to conclude that the use of ICTs in governance does strengthen community participation and improve public services, and government responsiveness and accountability.

In light of this, we can say that ICT initiators and implementers involved in governance, whether they work with governments (particularly local governments) or NGOs, CSOs or ICT companies, can learn from the five areas identified in this research: (1) the need to understand ICT ecosystems; (2) disconnections; (3) circular patterns; (4) flexible patterns of implementation; and (5) the need to harmonise online and offline aspects.

Further to this, we offer the following recommendations for other actors in ICT ecosystems.

Research institutions and universities should conduct further research on potential ICT-based governance initiatives in Indonesia. Specifically, this needs to study the behaviour of the many ICT actors working in governance, and ask how this behaviour influences public service delivery.

Further learning about ICT programmes for governance is needed at a time when their potential is growing in Indonesia. A systematic analysis could explore, for example, how the ten initiatives studied here are being implemented across Indonesia – in the different actor configurations, ICT ecosystems and governance arrangements that exist in this highly diverse archipelago. Given Indonesia's unusual diversity, further knowledge about the five areas of learning identified will help to build and develop initiatives that respond to the differing needs and contexts of local ecosystems and actors.

Donors and other development agencies play an important role in developing knowledge on ICT-based governance work. As good governance practices are strengthened in Indonesia, and local government and CSOs respond to increasing ICT utilisation for governance, providing practical knowledge on this issue is greatly needed. Donors and other development agencies have important experience to offer, which can help in this regard.

The *private sector* plays an important role in the development of ICT-based governance initiatives, not least through corporate social responsibility funds, which can be used to develop ICTs for governance. There is an incentive for the private sector to get involved, as strengthening governance systems will help to create the stable investment environment that it needs.

Bibliography

Ackerman, J. (2004) 'Co-Governance for Accountability: Beyond "Exit" and "Voice"', *World Development* 32.3: 447–463

Basu, S. (2004) 'E-government and Developing Countries: An Overview', *International Review of Law, Computers & Technology* 18.1: 109–132

Bertot, J.C.; Jaeger, P.T. and Grimes, J.M. (2010) 'Using ICTs to Create a Culture of Transparency: E-Government and Social Media as Openness and Anti-Corruption Tools for Societies', *Government Information Quarterly* 27.3: 264–271

Callon, M. (1986) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay', in J. Law (ed), *Power, Action and Belief: A New Sociology of Knowledge?*, London: Routledge Kegan & Paul

Check My School (nd) 'Cek SekolahKu', Jakarta: Transparency International Indonesia, http://ceksekolahku.or.id (accessed 13 November 2017)

Cressman, D. (2009) *A Brief Overview of Actor–Network Theory: Punctualization, Heterogeneous Engineering & Translation*, Burnaby: ACT Lab / Centre for Policy Research on Science & Technology School of Communication, Simon Fraser University

Dachlan, D. (2016) 'Monitoring App Qlue Helps Jakarta Improve Services, Efficiency', *Jakarta Post*, 30 May, www.thejakartapost.com/life/2016/05/30/monitoring-app-qlue-helps-jakarta-improve-services-efficiency.html (accessed 13 November 2017)

Devarajan, S.; Khemani, S. and Walton, M. (2013) 'Can Civil Society Overcome Government Failure in Africa?', *World Bank Research Observer* 29.1: 20–47

Diga, K. and May, J. (2016) 'The ICT Ecosystem: The Application, Usefulness and Future of an Evolving Concept', *Information Technology for Development* 22: 1–6

Furuholt, B. and Wahid, F. (2008) 'E-Government Challenges and the Role of Political Leadership in Indonesia: The Case of Sragen', in *Proceedings of the 41st Annual Hawaii International Conference on System Sciences* (HICSS 2008), Washington, DC: IEEE Computer Society

Halloran, B. (2015) *Strengthening Accountability Ecosystems: A Discussion Paper*, Think Piece, Washington, DC: Transparency and Accountability Initiative, www.transparency-initiative.org/archive/wp-content/uploads/2015/11/Strengthening-Accountability-Ecosystems.pdf (accessed 16 October 2017)

Harijadi, D.A. (2004) 'Developing E-Government: The Case of Indonesia', 29th meeting of the APEC Telecommunications and Information Working Group, Hong Kong, 21–26 March, http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN017960.pdf (accessed 13 November 2017)

Harpham, T. and Boateng, K.A. (1997) 'Urban Governance in Relation to the Operation of Urban Services in Developing Countries', *Habitat International* 21.1: 65–77

Haryono, T. and Widiwardono, Y.K. (2003) *Current Status and Issues of E-Government in Indonesia*, Jakarta: Association of Southeast Asian Nations

Hellstrom, J. (2008) 'Mobile Phones for Good Governance – Challenges and Way Forward', W3C workshop paper, www.w3.org/2008/10/MW4D_WS/papers/hellstrom_gov.pdf (accessed 13 November 2017)

Hermana, B. and Silfianti, W. (2011) 'Evaluating E-Government Implementation by Local Government: Digital Divide in Internet-Based Public Services in Indonesia', *International Journal of Business and Social Science* 2.3: 156–163

Jahja, R.; Haryana, M.D. and Rendra, M. (2012) *Sistem Informasi Desa: Sistem Informasi dan Data untuk Pembaruan Desa*, Yogyakarta: Combine Resource Institution

Jakarta Post (2016) 'Qlue Users See Feedback Decline After Ahok Becomes Inactive', *Jakarta Post*, 29 November, www.thejakartapost.com/life/2016/11/29/qlue-users-see-feedback-decline-after-ahok-becomes-inactive.html (accessed 13 November 2017)

Jurriens, E. and Tapsell, R. (2017) *Digital Indonesia: Connectivity and Divergence*, Canberra: ISEAS Publishing

Nurdin N.; Stockdale, R. and Scheepers, H. (2012) 'Benchmarking Indonesian Local E-Government', in *Pacific Asia Conference on Information Systems 2012 Proceedings*, Atlanta, GA: Association for Information Systems

OECD (2016) 'Open Government in Indonesia', OECD Public Governance Review, Paris: Organisation for Economic Co-operation and Development

Okot-Uma, R.W.O. (2000) 'Electronic Governance: Re-inventing Good Governance', London: Commonwealth Secretariat London, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.2101&rep=rep1&type=pdf (accessed 13 November 2017)

Open ePolicy Group (2005) *The Roadmap for Open ICT Ecosystems*, Cambridge, MA: Berkman Center for Internet and Society at Harvard Law School

Palvia, S.C.J. and Sharma, S.S. (2007) 'E-Government and E-Governance: Definitions/Domain Framework and Status Around the World', in *International Conference on E-Governance*, New Delhi: International Congress of E-Government, http://csi-sigegov.orgwww.csi-sigegov.org/1/1_369.pdf (accessed 13 November 2017)

Putri, D.A; Maharani Karlina, C.H. and Tanaya, J. (2016) *From Smart City to Open City: Lessons from Jakarta Smart City*, Jakarta: Centre for Innovation Policy and Governance

Rahardjo, E.; Mirchandani, D. and Joshi, K. (2007) 'E-Government Functionality and Website Features: A Case Study of Indonesia', *Journal of Global Information Technology Management* 10.1: 31–50

Rokhman, A. (2011) 'E-Government Adoption in Developing Countries: The Case of Indonesia', *Journal of Emerging Trends in Computing and Information Sciences* 2.5: 228–236

Shim, D.C. and Eom, T.H. (2009) 'Anticorruption Effects of Information Communication and Technology (ICT) and Social Capital', *International Review of Administrative Sciences* 75.1: 99–116

World Bank (2017) *World Development Report 2017: Governance and the Law*, Washington, DC: World Bank

World Bank (2015) *World Development Report 2016: Digital Dividends*, Washington, DC: World Bank

World Bank (2004) *Making Services Work for Poor People: World Development Report 2004*, Washington, DC: World Bank

Yuliar, S. (2009) *Tata Kelola Teknologi: Perspektif Teori Jaringan Aktor*, Bandung: Penerbit ITB

About Making All Voices Count

Making All Voices Count is a programme working towards a world in which open, effective and participatory governance is the norm and not the exception. It focuses global attention on creative and cutting-edge solutions to transform the relationship between citizens and their governments. The programme is inspired by and supports the goals of the Open Government Partnership.

Making All Voices Count is supported by the UK Department for International Development (DFID), the United States Agency for International Development (USAID), the Swedish International Development Cooperation Agency (SIDA) and the Omidyar Network, and is implemented by a consortium consisting of Hivos, Institute of Development Studies (IDS) and Ushahidi.

Research, Evidence and Learning component

The programme's Research, Evidence and Learning component, managed by IDS, contributes to improving performance and practice, and builds an evidence base in the field of citizen voice, government responsiveness, transparency and accountability (T&A) and technology for T&A (Tech4T&A).

Web www.makingallvoicescount.org
Email info@makingallvoicescount.org
Twitter @allvoicescount

About Bandung Institute of Governance Studies

Bandung Institute of Governance Studies (BIGS) is a research and advocacy institution, working to develop innovation, new knowledge, and policy recommendation to help produce development processes and results that have quality and impact. To ensure development benefits are delivered, BIGS encourages collaboration between government and citizen. The collaboration must be constructive and advantageous to all, and is based on knowledge, technology and innovation.

Disclaimer: This document has been produced with the financial support of the Omidyar Network, SIDA, UK aid from the UK Government, and USAID. The views expressed in this publication do not necessarily reflect the official policies of our funders.

Implemented by:

EDITING: HELEN DIXON (HELENCLAREDIXON@GMAIL.COM) AND TIM WOODS (T.WOODS@GREENINK.CO.UK) | LAYOUT: GREEN INK (WWW.GREENINK.CO.UK)